OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

OLUME 44, NO. 5
EBRUARY 28, 1955

AMERICAN DYESTUFF REPORTER

Devoted to Textile Chemistry
BLEACHING · DYEING · PRINTING · FINISHING

Fashion Predicts for Fall . . .
medium browns to beige in burnished and piquant shades that reflect the gleam of copper and aroma of spice. Among the forecast favorites are Castilian Copper, Coppermist, Harvest Gold, Spiced Pumpkin, Butterscotch, Coffee Frappé, and Tawny Spice.
FASHION SHADES SIMPLIFIED WITH IRGALANS
The Irgalans have greatly simplified the matching mode shades —particularly browns and beiges—on wool or nylon.
• Irgalans include a range of browns and greys as base colors that eliminate radical shading elements.
• Irgalans give the dyer maximum control of shade at all times.
• Irgalans will match the important brown shades for Fall with better control of shade change to meet varying requirements *under any light.*
• Irgalan formulations perform consistently from laboratory to dyehouse and from batch to batch.
• Irgalan combinations draw *true to shade* from the initial strike to the required depth.
The neutral-drawing Irgalans produce unfailingly level results in short dyeing time, with outstanding light and wet fastness and with amazing retention of the fibre's natural qualities. On nylon, "blocking" is reduced to a minimum.
Use the Irgalans to dye your fashion shades for Fall.
IRGALAN* colors
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DIVISION OF GEIGY CHEMICAL CORPORATION
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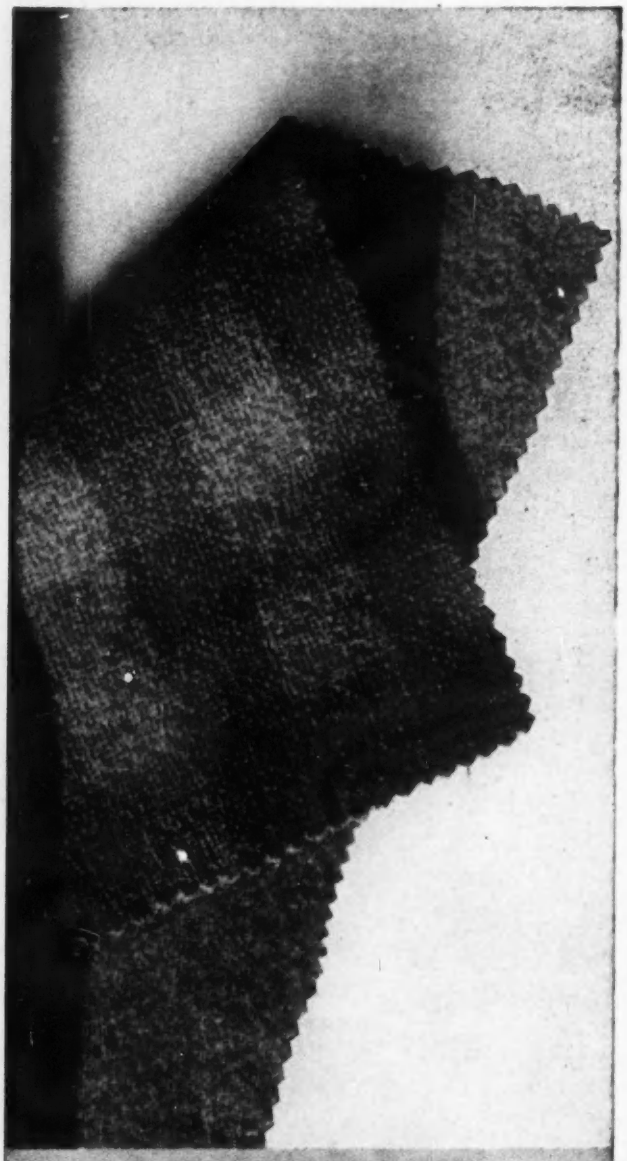

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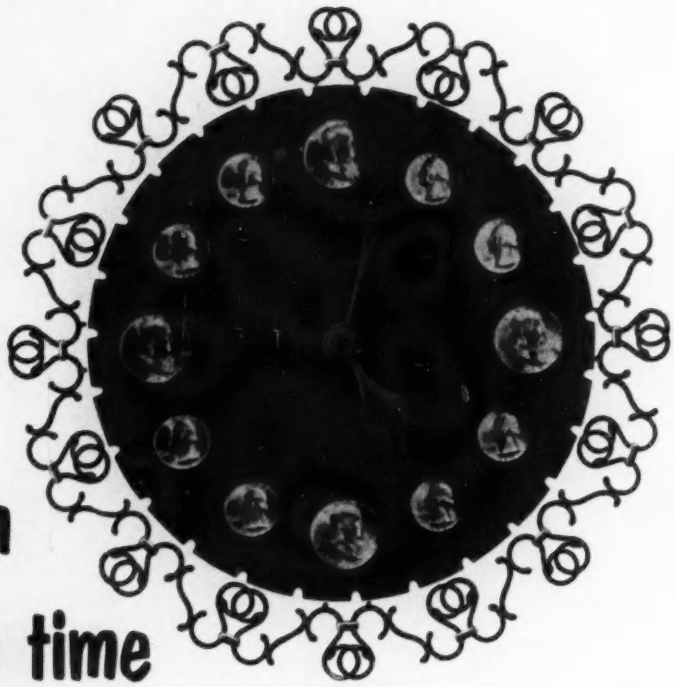

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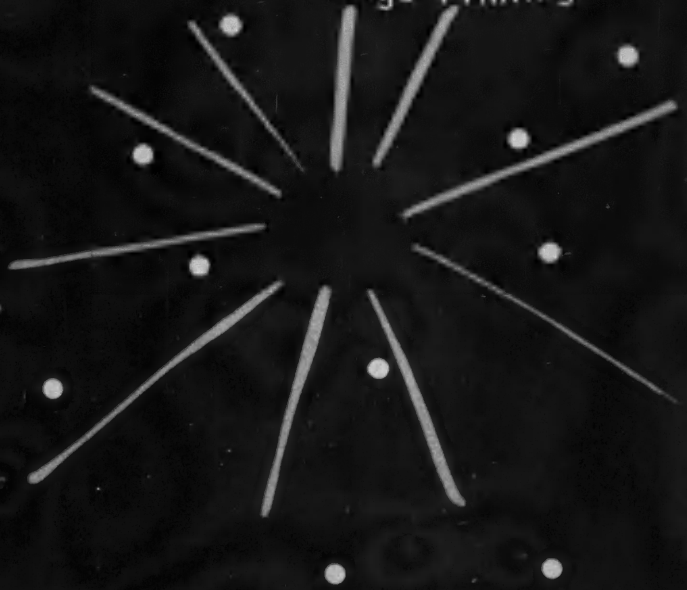

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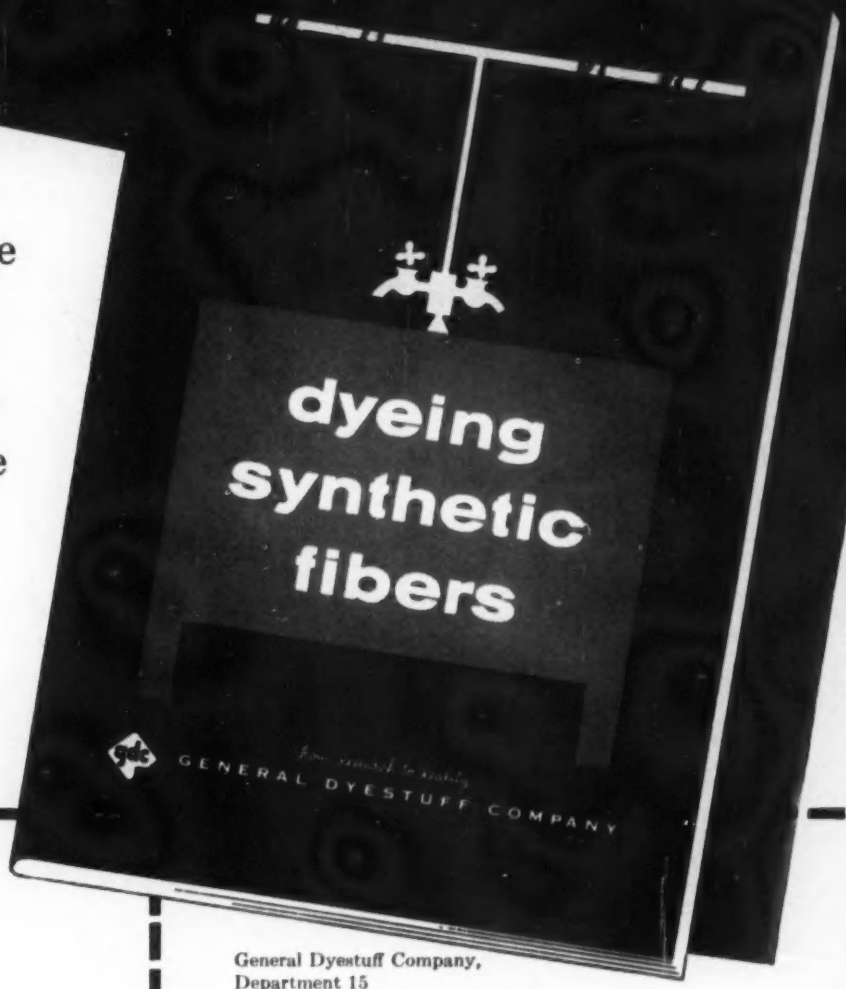

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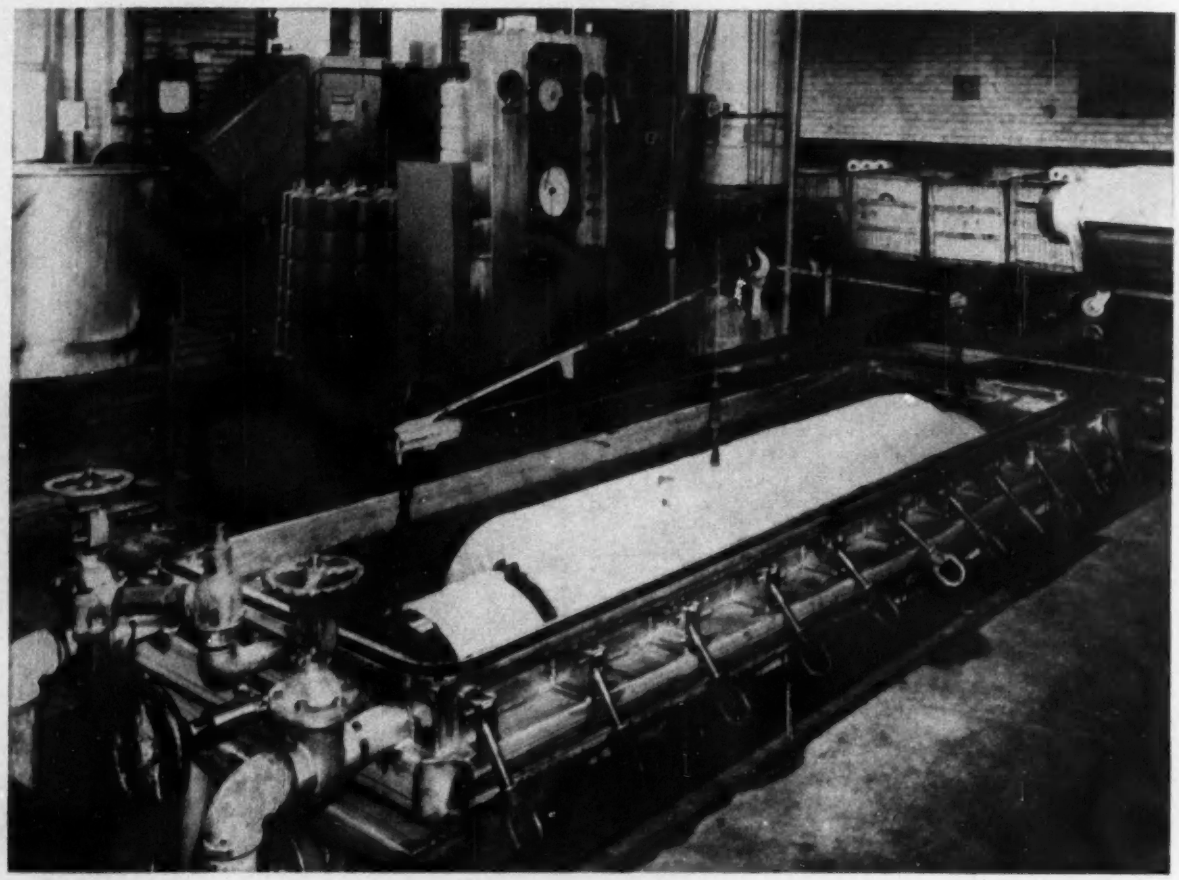

Taylor controlled Burlington Pressure Dye Machine installed at *Munsingwear, Inc.*

PICTURED ABOVE is a new Burlington Pressure Bleach, Boil-off and Dye machine recently purchased by Munsingwear, Inc. for use on tricot, and other knitted and open weave fabrics. With liquor being circulated through the machine at the rate of 1,500 gallons per minute the control of temperature and pressure is all important.

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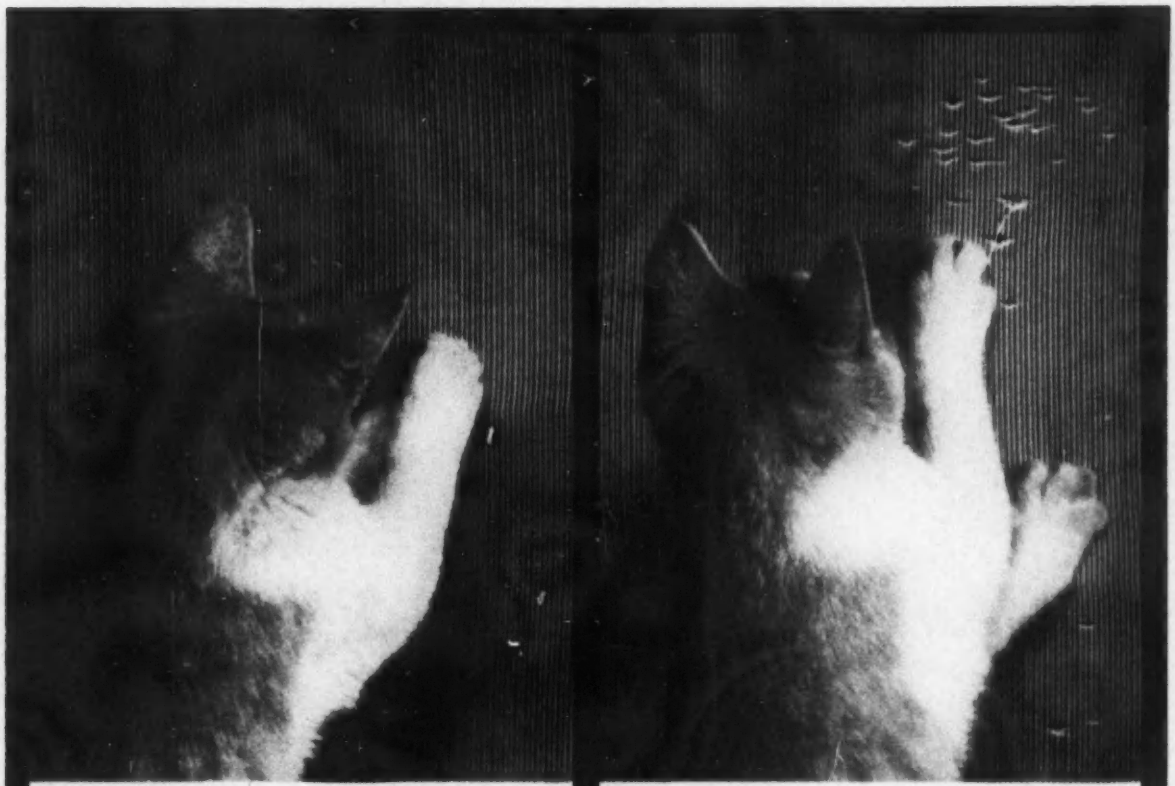

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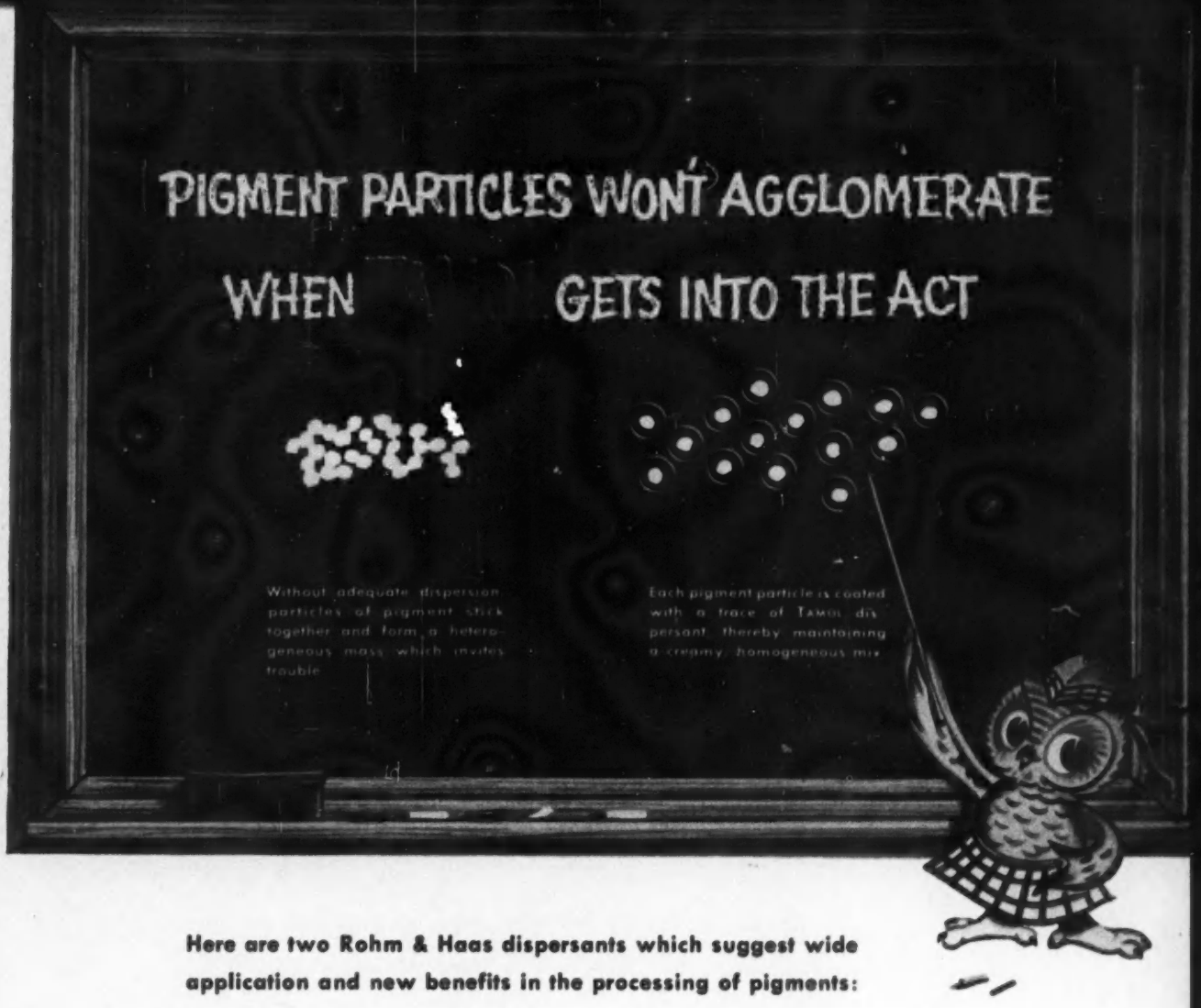
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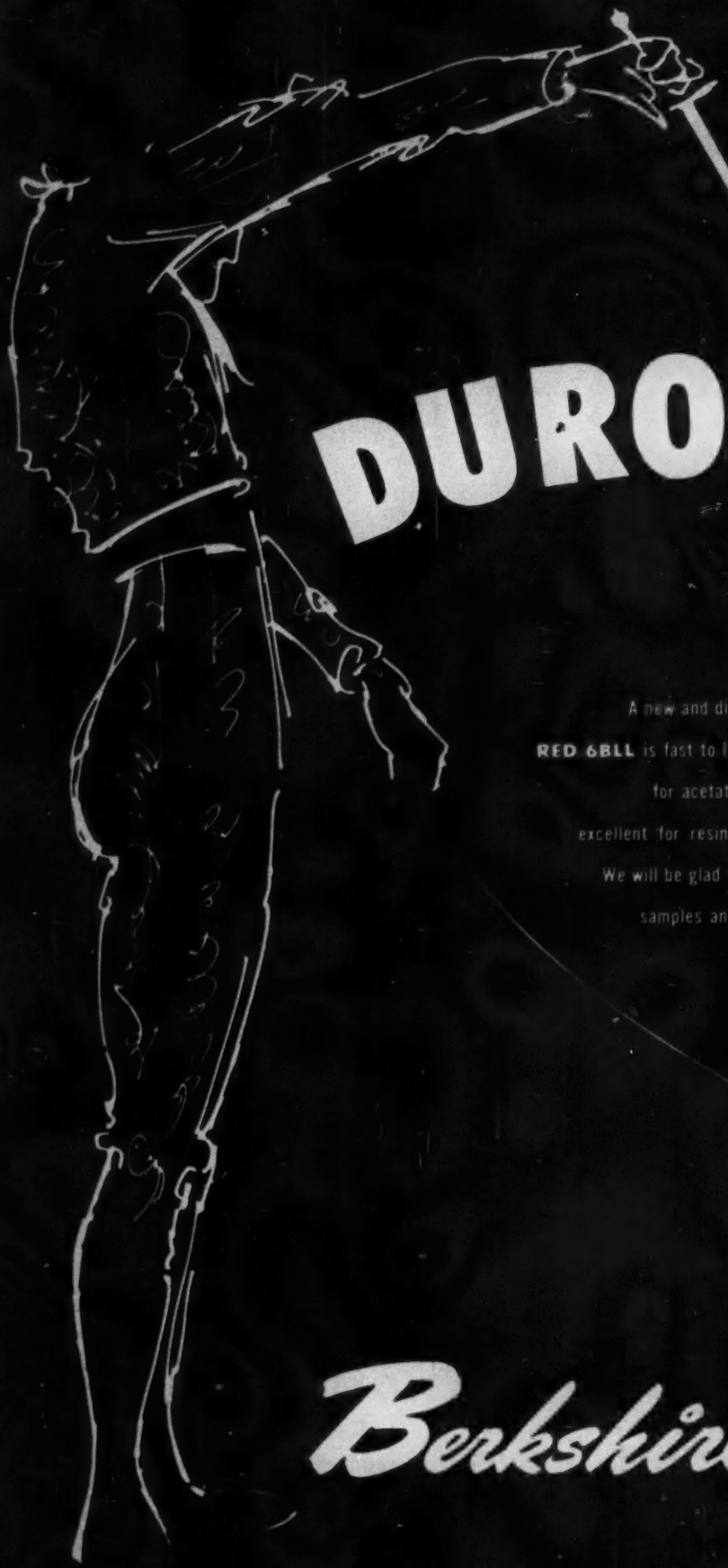

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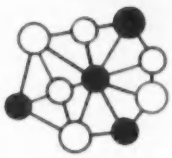

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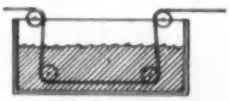

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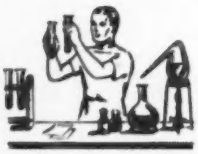

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CIBALAN BRILLIANT YELLOW 3GL and **CIBALAN BRILLIANT BLUE G** are new colors of special interest. They extend the color range of the group and permit brighter Cibalan dyeings. For the first time, it is now possible to dye bright greens on wool and nylon with the working properties and light and wash fastness afforded by the Cibalans.

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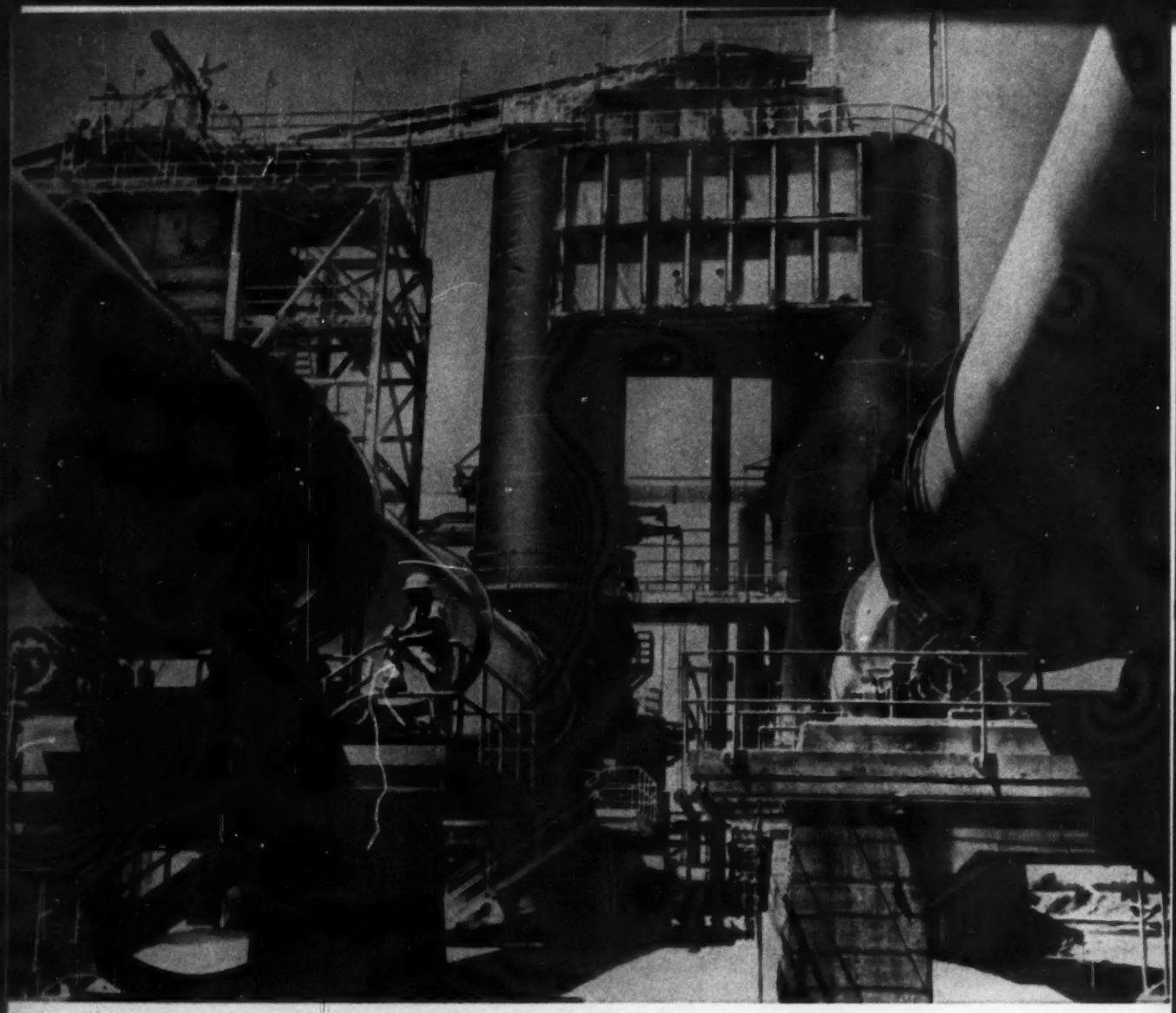

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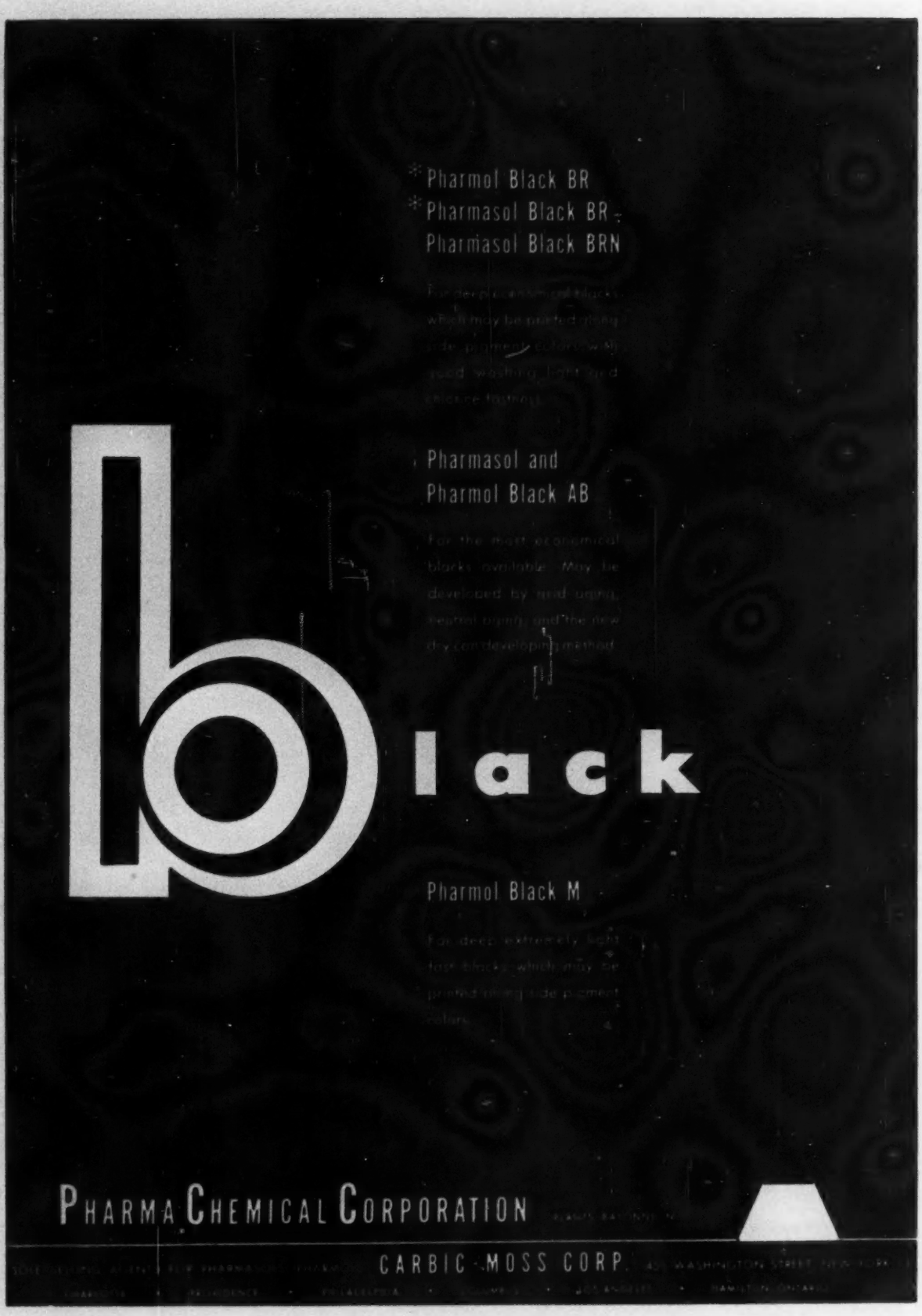
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OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

HOWES PUBLISHING COMPANY, INC.
44 E. 23rd Street, New York 10, N. Y.
C. R. Howes, President; Ernest F. Fullam, Executive Vice-President; Norman A. Johnson, Vice-President; Myron D. Reeser, Secretary; C. Essenbreis, Treasurer

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Proceedings of the

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Editor of Proceedings: Carl Z Draves, 30 Lahey St, New Hyde Park, N Y

FEBRUARY 28, 1955

AATCC CALENDAR

(*a general calendar of events may be found on page* 157)

COUNCIL
Apr 29 (Hotel Dennis, Atlantic City, N J); June 17; Sept 21 (Chalfonte-Haddon Hall, Atlantic City, N J); Nov 18; Jan 20, 1956; Apr 20, 1956; June 15, 1956.

NATIONAL CONVENTIONS
Sept 22-25, 1955 (Chalfonte-Haddon Hall, Atlantic City, N J; 1956 (Waldorf-Astoria, New York); 1957 (Boston); 1958 (Chicago); 1959 (Washington, DC—tentative).

HUDSON-MOHAWK SECTION
Apr 15 (Jack's Restaurant, Albany, N Y); May 20 (Ladies Night); June 24 (Annual Outing).

MID-WEST SECTION
Apr 16 (Netherlands Plaza, Cincinnati, O); June 11 (Annual Outing—Lake Lawn Lodge, Delavan, Wis).

NIAGARA FRONTIER SECTION
Mar 4 (Hamilton, Ont); April 22 (Buffalo); June 24 (Outing).

NEW YORK SECTION
March 18, April 22, May 20 (Kohler's Swiss Chalet, Rochelle Park, N J).

NORTHERN NEW ENGLAND SECTION
Apr 22; June 10 (Annual Outing); Oct 14; Dec 9.

PHILADELPHIA SECTION
Mar 4 (Penn-Sherwood Hotel, Philadelphia); Apr 15 (Kugler's Restaurant, Philadelphia); May 20 (Outing———Manufacturer's Golf & Country Club, Oreland, Pa); Oct 21 (Penn-Sherwood Hotel); Dec 2. Jan 13 (Kugler's Restaurant).

PIEDMONT SECTION
Apr 30 (Robert E Lee Hotel, Winston-Salem, N C); June 10-11 (Mayview Manor, Blowing Rock, N C); Oct 29 (Hotel Wm R Barringer, Charlotte, N C).

SOUTH CENTRAL SECTION
May 14 (Hotel Patten, Chattanooga, Tenn); July 29-30 (Lookout Mtn Hotel, Chattanooga, Tenn — pending); Dec 10 (Hotel Patten, Chattanooga, Tenn).

SOUTHEASTERN SECTION
Apr 23 (American Legion Club, Lindale, Ga); June 3-4 (Annual Outing, Radium Springs, Ga); Sept 10 (Ralston Hotel, Columbus, Ga); Dec 3 (Atlanta Biltmore, Atlanta, Ga).

WASHINGTON SECTION
May 20.

WESTERN NEW ENGLAND SECTION
Mar 18 (Rapp's Restaurant, Shelton, Conn); May 13 (Ladies Night); June 17 (Annual Outing); Sept 16 (Rapp's); Nov 4 (Hartford, Conn); Dec 16 (Rapp's).

NOTE
The Employment Register for this issue will be found on page P150.

—— 1955 Convention Notes ——

THE Philadelphia Section has revealed the following plans for the 1955 AATCC Convention, to be held Sept 22-24 at Chalfonte-Haddon Hall, Atlantic City, N J:

1) The technical program will emphasize mill problems of the dyer and finisher in an attempt to attract a larger number of men from this particular phase of the industry. The technical sessions will be held Thursday afternoon, September 22; Friday morning, September 23; and Saturday morning, September 24.

2) The Technical Committee on Research will be in session Thursday morning, September 22. Intersectional Contest Papers from the various sections will be heard Saturday afternoon, September 24.

3) The Olney Medal Award will be given at a dinner Thursday evening, September 22. The Alumni Luncheon is planned for Saturday noon, September 24.

4) The entire proceedings of the Convention will be climaxed with a banquet and entertainment Saturday evening, September 24.

ACTIVITIES OF THE LOCAL SECTIONS

NEW YORK———Approximately 250 members and guests attended the January 28th meeting of the New York Section at the Hotel Statler, New York, N Y.

Edmund A Leonard discussed briefly the work of the National Research Advisory Committee, which has been formed to inventory the need for research projects and to expand the participation of members. He also requested that persons interested in volunteering for work on the Section's 1956 Intersectional Contest paper should contact Emil C Hansen at General Dyestuff Co.

Hector C Borghetty of Rohm & Haas Co presented a paper entitled "Crease-Resistant Finishes on Cotton Fabrics."

* * * * * *

NIAGARA FRONTIER———The Niagara Frontier Section met on January 28th at the Hotel Markeen, Buffalo, N Y, with 28 members and guests present. The featured speaker, Edward B Mates, medical director, National Aniline Div, Allied Chemical & Dye Corp, discussed "Toxicology of Dyestuffs and Textile Chemicals."

* * * * * *

WESTERN NEW ENGLAND———AATCC President Raymond W Jacoby was among the 70 members and guests in attendance at the January 28th meeting of the Western New England Section at Rapp's Restaurant, Shelton, Conn. The technical program featured a talk on "The Recent Developments in the Use of Polyvinyl Alcohols," by Leonard S Shapiro, director of sales service, Borden Company Chemical Division, Polyco Department.

* * * * * *

WASHINGTON———The Washington Section held its first meeting of the year on February 11th at the Occidental Restaurant, Washington, D C, at which time the newly elected section officers were introduced. Following this, Walter M Scott, AATCC vice president (Southern Region) reported on the January Council meeting in New York. A discussion by T F Cooke, manager of American Cyanamid Company's Textile Resin Department, on "The Mechanism of Wrinkle-Resistant Finishes for Cellulosic Fabrics" highlighted the technical program.

The attendance at the meeting was held down to thirty because of a paralyzing snowfall during the late afternoon.

AATCC Research Newsletter No. 19

NEWS IN GENERAL

Something new at the 182nd meeting of the Technical Committee on Research—January 21 in New York—was the allocation of an hour's time to an open discussion on "What Information is Available to AATCC Research on End-Use Experience with Textiles that Will Aid in Our Development of Improved Test Procedure?" . . . ECR Chairman Leonard Little outlined the need for data on actual end-use experience, so that AATCC research can be guided properly in its development of tests which reflect end-use performance. . . . TCR members agreed on the need, and contributed a number and variety of sources for such information, including industry, government and trade associations. These sources will be contacted and data collection efforts set in motion.

Council approved details of the new Corporate Membership program worked out by Al Johnson and his committee. The new campaign will include a printed presentation folder and new application form, and a completely revised schedule of suggested dues, based on dollar sales and relative interest of firms in AATCC research. The program will be put into operation as soon as practical, beginning with a kick-off press introduction in New York.

AT RESEARCH HEADQUARTERS

The headquarters staff at Lowell is busily engaged in preparing hundreds of textile specimens to be subjected to atomic explosion in the forthcoming Nevada A-blast tests. These specimens embrace natural and synthetic fibers and will be specially mounted on panels to be placed at various distances from "ground zero." Dr Steigler is project officer, and Charlie Dorn (TCR chairman) and P J Fynn are acting as technical consultants. Mannequins clothed in garments furnished by J C Penney Co will also be exposed to the blast. Results of the extensive test—including on-the-spot evaluation of the effects of the blast—will supply information on the degree of protection a wearer of today's clothing may receive from atomic explosion.

C D Kirchner and L Wax, of the Pellon Corp, visited AATCC headquarters at Lowell recently, and were considerably interested in determining the wet and dry resistance to abrasion of one their company's products in the Accelerotor. . . . They took with them corporate membership information and application forms. . . .

COMMITTEE NEWS

Four functions of the National Research Advisory Committee were approved at the January 20-21 meetings: 1) to coordinate and stimulate research activities between sections of AATCC; 2) to prepare and circulate lists of industry and consumer problems for use by sectional committees; 3) to survey industry for problems to which AATCC research could be applied, with a view to pointing up selected problems for research committee action; and 4) to stimulate interest in all research activities by a greater number of members. Committee chairman Eugene W K Schwarz, vice-chairman Ed Leonard and secretary John Hagen have held preliminary talks to select members and set up broad plans for implementing this project.

W A Holst, E W Lawrence and E A Leonard are new members of ECR. Mr Holst and Mr Lawrence will serve three-year terms, and Mr Leonard has a one-year term.

Name of the Atmospheric Fading Committee was changed Jan 21 to "Committee on Fading of Dyed Textiles Due to Atmospheric Contaminants," to allow scope for study of other contaminants besides gases. . . . John Zapp has been appointed chairman of a new committee to develop a test procedure for evaluating dermatological effects of textiles, dyes and finishes.

The 2A, 3A and 4A wash tests have been made standard tests, following recommendations by the Committee on Colorfastness to Washing, P J Fynn, chairman . . . S N Glarum replaces Kenneth Barnard as chairman of the committee on Antistatic Finishes, following expiration of Mr Barnard's three-year chairmanship term. . . . Bob Allison has been named new secretary of Executive Committee on Research, and Matt Babey is new secretary of Technical Committee on Research. . . . Other new members of TCR: Steve Kennedy, Frank Rizzo, George S Wham and John J Hanlon. . . . Osborne C Bacon has been appointed chairman of the Committee on Standard Soils.

A list of proposed standard definitions prepared by the Committee on Definitions, George H Hotte, Chairman, has been sent to all members of TCR and Council for study. They have been asked to promptly forward any corrections, additions or comments to Dr Steigler's attention, for ultimate use by Mr Hotte's committee in a final publication of these definitions.

A COMPARISON OF AATCC SUNLIGHT TESTS WITH THE PROPOSED INTERNATIONAL DAYLIGHT TEST*

AATCC COMMITTEE ON COLORFASTNESS TO LIGHT
MATTHEW J BABEY, Secty

PURPOSE

THE purposes of this survey were to compare the American Method of Sunlight Testing with the Proposed ISO Daylight Method for Colorfastness to Light and to compare American AATCC Wool Blue Standards with the Proposed ISO Wool Blue Standards for Classification of Colorfastness to Light.

EXPERIMENTAL

DESCRIPTION OF TESTS———The new window-glass outdoor Light-Exposure Cabinet DE-1 *(1)* made by the Atlas Electric Devices Co was used for all testing.

Sunlight testing was carried on only between 9 AM and 3 PM standard time in bright sunlight, whereas the Daylight Tests were made by continuous exposure irrespective of sunlight conditions.

Various sections of the United States were used for these exposures: New York, N Y; Chicago, Ill; Washington, D C; Phoenix, Ariz; Miami, Fla; Lowell, Mass; Los Angeles, Calif; Bound Brook, Salem and Deepwater, N J.

Most of the tests were made during the months of June, July, August and September of 1953.

METHOD OF TESTING———Testing was made by first exposing the Wool Blue Standards (starting with L2) to a fade similar to Step 4 on Grey Scale *(2, 3)*. (Step 4 is the degree of fading defined as *just appreciable*). The results are given in Table I. Test samples exposed simultaneously with the Wool Blue Standards were then examined, and, if a test sample showed any degree of fading, a portion of it was covered, as was a portion of the Wool Blue Standard showing Step 4 fading.

The Wool Blue Standards and samples were further exposed until they reached a degree of fading corresponding to Step 3 on the Grey Scale.

METHOD OF EVALUATION———After all of the test samples were returned by the participating laboratories, they were mounted on a separate card. These exposures were examined by a trained group for a numerical value of the degree of fading by use of the Grey Scale. Numerical fastness ratings were assigned to the test samples when the Grey-Scale values of the test samples agreed with those of the Wool Blue Standards exposed simultaneously. The resultant light-fastness ratings for the various dyed samples are given in Table II.

TABLE I

COMPARISON OF WOOL BLUE STANDARDS IN SUNLIGHT AND DAYLIGHT

Grey Scale Values After Equal Exposures For Each L Level, Respectively

	Sunlight		Daylight	
	American	*European*	*American*	*European*
L2 1st	4.2	2.8	4.3	3.1
2nd	3.9	2.3	3.6	2.4
L3 1st	4.4	2.9	4.2	2.5
2nd	3.5	1	2	1
L4 1st	4.3	3.2	4	2.9
2nd	2.5	2	3	1.5
L5 1st	4.5	3.9	4.2	3.6
2nd	3.8	3.3	3.5	2.5
L6 1st	4.3	3.2	4.4	3.6
2nd	4	3	3.8	2.7
L7 1st	4.5	4.5	4.5	4.5

EXPLANATION OF TABLE———The same period of exposure was made as a basis for comparison in each set of tests, the first set being those for the L2 Blue Standards, the second for the L3 Blue Standards, etc. Numerical Grey-Scale ratings for resistance to fading were determined in a given set at both the first and second fade. The values shown are averages of all the ratings obtained. When the L2 Blue American Standard received a Grey-Scale rating of 4.2 for the first fade in sunlight, it meant that that Standard resisted exposure sufficiently well to fade a little less than 1½ Judd Units, as explained in reference (3); the figure *does not* mean a light-fastness rating of L4. The exposures were of course progressively longer from L2 to L7.

TABLE II

AVERAGE LIGHT-FASTNESS RATINGS BY EACH METHOD

Dyestuff	*Dyeing on*	*Fiber*	*L Rating by American Sunlight*	*Number of Observers*	*L Rating by European Daylight*	*Number of Observers*	*Difference ISO AATCC*
Artisil Yellow G		Dynel	4.2	12	5.4	10	+1.2
Acetamine Orange GR		Nylon	4.5	12	5.4	10	+0.9
DuPont Orange RO		Orlon	3.35	10	5.0	9	+1.7
Polar Brilliant Red G		Wool	4.1	12	5.4	11	+1.3
Calcosol Violet 6RD		Cotton	4.8	13	6.1	7	+1.3
Acetamine Rubine B Conc		Dacron	3.8	14	5.2	7	+1.4
Erio Rubine B Conc		Wool	4.4	13	6.0	8	+1.6
Eastman Fast Brilliant Red 2BGLF		Acetate	4.1	8	5.6	5	+1.5
Roracyl Orange R		Orlon	7.2	9	7.2	10	0
Calcosol Navy Blue		Cotton	4.3	13	5.3	12	+1.0
Celanthrene Red 3BN Conc		Dacron	6.2	8	6.8	9	+0.6
Sulfonine Yellow 2G		Dynel	5.7	12	6.1	12	+0.4
Chromacyl Orange GR		Nylon	5.2	12	6.4	11	+1.2

CONCLUSION

It was found that, by the ISO Daylight method, from 0.4 to 1.7 higher rating is obtained than by the American AATCC Sunlight Method for samples of fastness L2 to L6 inclusive. Samples of very high light fastness corresponding to a rating of L7 were rated equal by both test methods.

The principal reason for higher ratings by the Proposed ISO Daylight Method was found to be the lower fastness of the Continental Blue Standards L2 to L6 inclusive.

Many thanks are extended to all who contributed in obtaining the data needed for this write up.

REFERENCES

(1) A description of the test cabinet appeared in "AATCC Research Bulletin #4" and in the *Am Dyestuff Reptr* 43, P379 (June 8, 1953).

(2) Details of the use of the Grey Scale appeared in the report of the AATCC Committee on Colorfastness to Light on Comparative Sunlight and Fade-Ometer Tests on Selected, Dyed, Manufactured Fibers, *ibid* 43, P748 (Nov 9, 1953).

(3) *Ibid* 43, P875 (Dec 21, 1953).

AATCC Symposium——

Finishing Session*

ARTHUR R WACHTER, *Chairman*
American Viscose Corporation
New York, N Y

PERCY J FYNN, *Co-chairman*
J C Penney Company
New York, N Y

I. OPENING REMARKS BY THE PRESIDING CHAIRMAN

ARTHUR R WACHTER
American Viscose Corporation
New York, N Y

MY assignment this morning is the pleasant one of welcoming you to the Finishing Session of the 1954 Symposium of the American Association of Textile Chemists and Colorists.

The fundamental purpose of this Symposium is to acquaint the manufacturing, converting and distributive branches of the textile industry with the important work and the various activities with which our Association's Research Committee is engaged. We want to tell you, too, that the strength of our Association is based upon the activities of our Research Committee, and we have thus become one of the leading scientific societies in this country and abroad.

Research is so important and so closely related to quality that we have selected as our theme and our subject "AATCC Research—Key to Quality". All of these technical sessions, and there are three of them being held here this morning, are therefore of direct interest to every branch of the trade whose merchandise is sold on a basis of practical serviceability.

Competition in the textile business is keen. Forces of competition tend to place a producer or distributor on the horns of a dilemma, because, on the one hand, the forces of price competition may compel some sacrifice of quality as a means of securing a competitive advantage or merely meeting competitive prices, and, on the other hand, competition in controlled quality may lead away from price reductions. What to do, that's the question. With market conditions as are existent today, every producer and every distributor must make some sort of adjustment to these forces. Types of adjustments vary greatly. Some firms are more successful in making these adjustments than others, and those who accomplish an adjustment are the ones who compete successfully with respect to both price and quality. All producers and distributors must adjust the quality of their textiles to consumer's buying power. If costs were entirely disregarded, and fabrics were made the best possible, that is, goodness limited only by knowledge and technological skill, their prices would be higher than most consumers can afford to pay and would be priced right out of the market. In producing fabrics for the mass market a careful and judiciously controlled quality, coupled to a low manufacturing cost, determines success.

The clothing needs of 180 million people vary greatly. Some need warmer garments than others because of climatic conditions. Some need tougher and stronger clothing than others because of the work they do. Age, sex, occupation, and economic status all contribute to wants and needs. To satisfy these wants, the industry must produce a tremendously wide assortment of styles, colors and types of fabrics, all within a high-quality range and in a low price bracket. The great majority of consumers, because of their income, need textiles that will give performance satisfaction in use as well as provide that important ingredient known as fashion or style. There are really very few fabrics offered in our market which are the "best possible technologically". To make a fabric the best in every respect would cost so much that few consumers could buy it. Consequently, the producer considers the features that are most important to assure a satisfactory performance, judged in terms of value for its price, and proceeds along those lines. A fabric designed to fit into a utility end use, where the only considered competitive adjustment is low cost, that fades and shrinks so that it becomes unsightly and too tight to wear is not worth buying, no matter how low the price.

What a fabric will do when used or worn can be determined only by tests, many of which require expensive equipment and skilled personnel; however, the added cost may well be worth paying if it lessens costly converting errors. Information concerning performance can be used for the control of quality as well as for informative labeling.

I have used up a whole lot of words telling you what I am certain you already know, probably better than I do, that your business is highly competitive, that you have got to produce a fabric to satisfy a style and fashion trend and that this fabric must meet good performance requirements. And, on top of all this, you've got to keep it in a low-cost price bracket so that you can sell it. No sense making it, if you can't sell it.

I repeat, I've used up a mess of words stressing competitive, style, performance, and price factors, and only because, if you can't meet all of these business problems by making a very stylish and well-performing fabric that you can sell at a reasonable low price, you will not long endure in this great business of textiles.

Now don't get too down in the mouth about all this because we are assembled here this morning for the sole purpose of telling you how the American Association of Textile Chemists and Colorists is equipped through its Research Committees to lighten your load.

Our research efforts enable us to help you in properly converting, dyeing, finishing or printing a fabric that comes pretty close to meeting most of the present-day consumer requirements for wearability and at the same time keeps the cost where it belongs. Scientifically processed and tested fabrics will therefore not be overbuilt and not overpriced.

* Held on May 19, 1954, as part of an all-day AATCC Symposium at the Hotel Statler, New York, N Y.

The AATCC Research Committee is very active in the important work related to equipment and tests for colorfastness, and a very thorough investigation of wash tests and wash fastness in general is being conducted at Lowell. The flammability test procedure described in CS 191-53 is a product of AATCC Research. Studies are being conducted on the water repellency of textiles with the general object of improving our test methods. Shrinkage tests for rayon fabrics are presently receiving serious attention in an effort to develop an instrument which can be used to predict shrinkage in actual wear accurately, quickly, and cheaply. There is no single textile problem that has not in the past, and that does not now, receive attention in some form or other from some committee. These committees, and there are many, are composed of industry's best talent. They are composed of the textile technicians employed by your industry. Your own industry has selected these men because of confidence in their technical ability. I am therefore not exaggerating when I say "Industry's most competent and experienced technical talent is working on industry's problems through this great Association."

These research efforts not only result in test procedures, but they so pinpoint that which is needed to produce low-cost, excellently performing textiles that this entire industry benefits therefrom. New methods for finishing fabrics containing both the older and the newer fibers are developed so that they meet test standards. Trade-named finishes for all kinds of end uses and on all kinds of fabrics are today available to our industry, mostly because AATCC research findings and test methods point to certain desirable properties which may enhance a fabric and which are not inherent in the fiber itself. Even machinery which permits of easy application of special finishes has been developed, and I am sure our Association can honestly assume that its research efforts are in a large measure responsible for this degree of progress.

This morning at this technical session we are presenting to you three speakers. One will tell you how the newer synthetics are finished. Another will tell you about trade-named finishes—what they mean to you and what they do to improve fabric. And from the third, we are to hear about some of the new-type finishing machinery, which has been designed and built to do a better and more accurate job at a lower cost.

II. FINISHING THE NEWER SYNTHETICS

HARRY MOORE
Fair Lawn Finishing Co
Fair Lawn, N J

INTRODUCTION

A NEW complex era has opened for the finisher of synthetic fabrics. Years ago the general problems confronting the modern finisher were centered around fabrics of the centuries-old fibers. His problem was to process these fibers in as an efficient a manner as possible with the best results obtainable. Today, the finisher has the old problems and many new ones.

During the past few years new fibers have been introduced to the textile industry, and they have made the finisher's job increasingly difficult. More highly trained personnel have had to be employed and entirely new techniques have had to be developed. In solving some of these problems the finisher has had considerable assistance from the fiber manufacturers and from the dyestuff and chemical industries; however, a great deal of work still lies ahead, not only in processing the individual fibers but in handling the myriad combinations that are made with the older fibers and with each other.

The consumer in purchasing the newer synthetic fabrics seeks functional and esthetic properties. He may want the functional properties of wrinkle resistance, dimensional stability, and water repellency, but he usually will not accept them at the sacrifice of appearance, handle, and drape. A proper finish should therefore impart functional needs plus esthetic quality.

The finishing of fabrics containing the new synthetic fibers has confronted the finisher with more problems than there are kinds of fibers. The author discusses first briefly the nature of nylon, Dacron, Acrilan, Dynel, Orlon, and Fiberglas and then takes up the finishing of fabrics containing these fibers.

Esthetic quality is a matter of individual taste. However, to determine functionality requires considerable research in developing standards and tests that are comparable to actual conditions. Being cognizant of these tests the consumer will be able to buy fabrics with confidence.

Since the main theme of this symposium is "AATCC Research—Key To Quality", I thought, when preparing this talk, that I would devote a few minutes in discussing the theme from the viewpoint of the early American and the present-day finisher.

Elijah Bemiss in 1815 apparently realized, *as we do here today*, that, in order to differentiate between good and bad quality, there must be standard tests. His simple recommendations for the protection of the consumer of woolens are worth repeating: "When cloth has been well milled and finished in a proper manner, it will be soft and firm; being shorn even, it will present you a short thick nap, which lies smooth in one regular direction; by drawing the hand the way the nap inclines it will feel sleek and smooth; move the hand the reverse way and the nap will feel rough and prickly. If the cloth will bear this inspection, you may conclude the workman has done his duty. If the goods present a flashy and fanciful color and come stiff from the press, many people suppose they are well dressed; but the stiffness which the cloth has acquired from a hot and close press is designed merely to conceal the faults of the finisher."

From this beginning, 140 years ago, it is interesting to glance through the AATCC Year Book at the splendid reports of our Research Committees. If Elijah Bemiss were here today, I am sure he would be pleased at the advance in the textile industry.

FINISHES ON VARIOUS FIBERS

NYLON———The oldest of the newer synthetics, nylon, was discovered by Carothers in 1928 and was first produced by Du Pont in 1938. It is known that an important characteristic of this fiber is its ability to assume and retain a set. It is therefore essential for the finisher to understand the principles involved in setting.

Basically, the heat setting of nylon causes a rearrangement and fixation of its internal molecular structure. Internal stresses are released and fibers tend to assume the structural arrangement under which they were set. The temperature and time required and the machine to be used can only be determined by the experience of the finisher. Heat setting

can be performed on textiles in the raw state, after scouring, after dyeing, or after finishing, according to the individual fabrics and the results desired.

In setting, there are several important factors that must be observed:

1) Accurate control of all setting conditions, such as time and temperature.

2) All parts of the fabric should be subjected uniformly to the setting conditions.

3) The fabric must be smooth and free of wrinkles during setting. Wrinkles that are set are not usually removed even by additional, more severe setting.

4) Excessive time at high temperatures must be avoided, as discoloration takes place, besides a loss of tensile strength and degradation of the material.

Setting is a relative term when applied to nylon. Nylon is never absolutely set; it is set only up to the point at which a more severe setting is imposed. The point of demarcation is where setting becomes damaged from excessive heat.

To illustrate the effect of setting on the hand of nylon, I have here yarn-dyed, spun-nylon samples before and after setting. You can notice the tremendous difference between these two samples: the unset sample has a rough, course, unpleasant handle, while the set sample is soft and crease-resistant and has a pleasant handle.

Although many finishes are applied to nylon, I will describe only a few.

Here is a durable, stiff finish requested by one of our customers and developed to his specifications by our company. It is now popular throughout the industry. The basis upon which this finish was developed is as follows: It is known that urea- and melamine-formaldehyde resins, when applied to rayon in the monomeric form with an acid catalyst, penetrate the fiber and become polymerized upon curing. Although these resins add weight and impart crease resistance to rayon, they do not stiffen the fabric. However, when these resins are applied to nylon, or to some of the other hydrophobic fibers, they cannot penetrate and therefore polymerize on the surface and thus impart a crisp handle. In this particular finish it was necessary to incorporate other chemicals to form a surface effect with satisfactory cohesive and adhesive properties to give durability to washing. All of these conditions were met, and the lingerie manufacturers have a durable, bouffant finish for petticoats.

There are nonslip finishes and soft finishes applied to nylon. Generally, the nonslip finishes do not penetrate the fabric but bind them, restricting their motion. The bonding of the warp and filling yarns where they cross each other prevents their movement. An increase in firmness of handle is a natural consequence.

Very soft finishes, on the other hand, lubricate these junction points and permit the fibers and yarns to slide over each other more freely. The most common types of softener used on nylon are cationic in nature.

DACRON———Dacron is a polyester fiber manufactured in this country by the Du Pont Company. It is produced from a polymer made from a chemical composition of ethylene glycol and terepthalic acid. This polymer was invented in England and is sold there under the trade name "Terylene". The Du Pont Company purchased the United States rights and produced it in this country under the name "Fiber V" and later "Dacron". The equipment for manufacturing is similar to that used for nylon.

Among the outstanding characteristics of properly constructed and properly finished fabrics of Dacron are wrinkle resistance and shape retention. It also has good abrasion resistance, high flex life, strength, and rapid drying.

The proper heat setting of filament-Dacron fabrics is even more important than the heat setting of nylon. Many filament-Dacron fabrics, whether they are set or unset, may wash satisfactorily with little or no shrinkage. If they are ironed, however, the difference becomes very apparent.

I have here two samples of filament-Dacron fabrics which were subjected to a condition similar to ironing at a temperature of 350°F. You will note the excess shrinkage of the improperly set fabric when compared with a satisfactorily set fabric.

I recently heard of two cases where the manufacturer, after completing his garments, decided to touch up with an iron a few places that were slightly wrinkled. Excessive shrinkage resulted, making the garment unusable. I believe the manufacturer should insist that his Dacron be properly set. Here at Fair Lawn, we feel so strongly about this phase of finishing filament Dacron that we have established the procedure of subjecting all filament Dacron, after it has been heat set, to temperatures of 350°F. We can thus be reasonably certain that the manufacturer and consumer will have no trouble with shrinkage by ironing.

The problems of static electricity are not new, but interest in them has become greater by the introduction of the new hydrophobic fibers. To the consumer, static electricity may manifest itself by the shock resulting from walking on a rug on a cool dry day, by the clinging of garments to his body under certain conditions, or possibly by the attraction of a garment for dust or dirt particles.

It is an established fact that the best way to prevent static on Dacron is to apply a finish that causes electric charges to leave the surface so rapidly that no charge accumulates. Our introduction to the static finishing problem was by accident. Shortly after the war we were experimenting with a combination of new chemical products on nylon to determine their effect on hand. After application of the finish, the pieces were run over an examining machine that had brass edges. I absentmindedly leaned against the brass and suddenly realized that the shock to which I had become accustomed didn't occur.

By repeated experiments we isolated one chemical product and found it to have unusual antistatic properties. Since then there has been a great deal of research by most of the chemical companies, but, to the best of my knowledge, no completely durable antistatic agent has been developed for Dacron.

Of all the new antistatic agents on the market there is one which we believe most promising on Dacron. This is a complex organic cationic compound which shows exceptionally good resistance to laundering with soap solution. However, laundering with solutions containing synthetic detergents causes a considerable decrease in the antistatic effect, whereas, when the fabric is laundered again with soap solution the original antistatic effectiveness is restored.

I have here two samples of Dacron: one treated with an antistatic finish and the other untreated. Both were rubbed vigorously on the edge of the table and then held one inch above a layer of dust. The dust seemed to leap at the untreated sample and remained stationary near the treated sample.

I also have two exhibits from the laboratories of one of our sister companies in Switzerland. These, written in German, illustrate this antistatic finish on nylon and Orlon. The first sample is untreated; the second is treated with the antistatic finish; and the third is treated with the antistatic finish and was given 10 washings in a soap solution. All samples were rubbed with a folded piece of material 20 times and then were held above powdered charcoal dust. You will note that the electrostatic charge of the untreated material attracted the coal dust while the others did not.

The AATCC has a very active research committee in the process of establishing standard methods of testing electrostatic charges.

PILLING ON DACRON———Pilling is a problem on spun Dacron which has

been given a great deal of study. As you may know, pilling is the balling up, on the surface of the fabric, of fibers which protrude through the surface. Wool has a tendency to pill, but, instead of remaining in small, hard balls, the fibers wear away or break off. It is probable that the greater abrasion resistance and strength of Dacron account for the pilled Dacron not behaving like wool.

Pilling on Dacron can be reduced, and in some cases eliminated, but it must be done with care or a harsh hand will result. Sometimes it may be necessary for the finisher to compromise somewhere between pilling and handle.

To obtain less pilling one must start with the proper selection of yarn and the proper construction of the cloth. For example, plied yarns are reported to give better pill resistance than single; increased yarn twist also causes an improvement, as well as tighter fabric weaves.

From the finishing point of view, brushing, shearing, and singeing appear to give the most satisfactory results. When singeing alone is tried, the long fibers melt to a hard bead on the surface giving a very harsh handle. By first brushing up the fiber and shearing, followed by singeing, the beads are much smaller and the handle less objectionable.

I have recently seen some of the experimental work performed by members of the Du Pont staff where the fabric was given a special type of brushing in the greige state followed by overfeed setting. This, in addition to the present methods, appears to be bringing us closer to complete elimination of pilling on Dacron.

I have here a suit on which the efforts of the yarn manufacturer, weaver, finisher, and converter were combined to produce the fine qualities it displays. Although this garment was washed twice in a home laundry machine, it still retains its original appearance as it came from the manufacturer.

ACRYLIC FIBERS———There are three American acrylic fibers in production today: Acrilan, Dynel, and Orlon. From a technical point of view, the greatest interest in these fibers is in dyeing. Although the finishing of these fibers does not present any exceptional problems, I will discuss them briefly.

ACRILAN———Chemstrand Corporation, the manufacturer of Acrilan, was organized by American Viscose Corporation and Monsanto Chemical Company. The know-how and textile experience of American Viscose and the chemical knowledge of Monsanto were combined in the development and production of Acrilan.

The major uses of Acrilan in our particular field have been in blends. One of the more popular has been a combination with viscose staple, such as illustrated by these samples.

The usual crease-resistant finishes, water repellents, etc, can be applied to this combination with good results. When pleated properly, the cloth will withstand hand washing with good retention of the pleats.

In former production, the finished appearance of union-dyed dark shades was impaired by fibralation. Fibralation might be described as a shattering of the surface of the fiber, giving a white or chafed appearance to the cloth. This condition is said to have been corrected in the recent production of the fiber.

DYNEL——Dynel, a co-polymer of acrylonitrile and vinyl chloride, is produced by Union Carbide and Carbon Chemicals Corporation. This fiber, like Acrilan, is sold only in staple form.

For some time, Dynel has been used in chemical-resistant clothing, filter fabrics, and other industrial uses. It is now being used in increasing quantities in blends for general apparel.

Here are a few practical suggestions for the finishing of woven fabrics containing a Dynel blend:

The *First Method* should be used if no covered frames are available or if finished goods are expected to give the desired width. After the goods have been dyed, rinsed, and extracted, dry them in a loop dryer. For light shades, high drying temperatures, such as 320-340°F can be applied. For dark shades, however, to avoid migration it is advisable to dry them at low temperatures, 225-250°F, and then return them in the loop dryer at temperatures as previously mentioned. The next step would be an application and drying of the resin at low temperatures. The goods should be fully relaxed in this and the following operation. Hereafter, the curing of the resin should take place at around 300°F. This procedure should result in a stiffening in the first drying operation, but the application of the resin, low-temperature drying and the curing of the resin at a temperature lower than the original setting temperature should result finally in a soft, pliable hand.

The *Second Method* should be applied when the goods are somewhat too narrow or if closed drying equipment is available. Dye, rinse, and extract. Dry on the frame at a temperature above 300°F, while at the same time stretching the goods in width 2-3 inches. There should be slight warp-wise tension. After this stretching operation, the goods will shrink about half way between the dried cloth width and the width the piece has been stretched to. A slight tension will avoid excessive working loss in the warp direction.

Hereafter, the resin can be applied and dried on. No stretching should take place from here on, and if possible, there should be a slight warp-wise over-feeding (3-4%). The curing of the resin should take place with the fabric in a relaxed stage and with the temperatures somewhat below the first drying operation. This procedure of high temperatures in the initial drying and somewhat lower temperatures in the curing should again result in a soft hand without additional operations.

In certain cases, especially if the goods are tightly constructed, they may be somewhat boardy despite the above precautions. In such a case, they can be taken back on a dye beck and run in cold water for 15-20 minutes, extracted, and dried at low temperatures without tension; or, they can be run through a padder containing a softener and dried again at a low temperature.

I have here a few samples of viscose and Dynel blends to illustrate the finishes we have just discussed.

ORLON———Orlon, manufactured by the Du Pont Company, is sold in both staple and filament forms. A recent change in manufacture of the staple has increased the dyeability of the fiber, thereby creating a greater demand in the apparel field. The staple is known as "Type 42" Orlon.

Here is a sample of a viscose and "Type 42" Orlon blend. You will notice that it was given a crease-resistant finish and was napped.

"Type 81", the filament Orlon, has been used in shirting with no unusual techniques necessary in finishing. When constructed for industrial purposes, "Type 81" Orlon may need a carefully controlled setting treatment, which will minimize shrinking in subsequent operations. I have here a sample of "Type 81" Orlon fabric which has been heat-treated and is ready for combining with cotton to be used for convertible auto tops.

FIBERGLAS———Fiberglas, a product of Owens-Corning Fiberglas Corporation, is comparatively new in textiles. The majority of its applications is in the industrial field, but there appears to be an increase of its application in the home. Considerable progress and development has occurred since we originally processed and colored Fiberglas fabrics in battleship grey for the navy. Research by the staff of Owens-Corning has improved and eliminated many of the weak points we formerly noted.

Briefly, this is the method of processing: Glass fabrics are first passed through an oven at a temperature of 1200°F. The organic matter, which might be in the

form of size, is burned off leaving a pure glass fiber. A crimp that conforms to the weave is set in the fiber, and the handle becomes soft and limp. Exceptional wrinkle resistance also results from this treatment.

Since the abrasion resistance is poor at this point, a finish must be applied which doesn't affect the wrinkle resistance; doesn't burn; withstands sunlight, atmospheric gases and organisms; improves the drape; and binds pigments. The finish that meets these specifications is described as an acrilonitrile type of latex.

After curing this finish, the next process is done to improve wash fastness. This consists of passing the cloth through a second pad containing stearato chromic chloride followed by curing. The Owens-Corning people like to picture this as "A sort of chemical bridge joining the glass to the acrylonitrile latex finish".

This process is known as "Coronizing".

CONCLUSION

There is a saying that good steel alone doesn't make a satisfactory automobile; so it is with the new synthetic fibers. The marvelous properties of these fibers cannot be realized unless they are put into the proper construction, finished correctly, converted wisely, and have the backing of the standard tests which the AATCC is establishing.

III. NEW FINISHING MACHINERY

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Three important items of new equipment are described. Full-scale Du Pont Barotors manufactured by Hunter are now in practical operation and are being improved from the experience gained in dyeing hundreds of thousands of yards of piece goods containing the newer fibers under pressure at 250°F, especially Orlon and Dacron. The advantages of the new machine in obtaining better dyeings, fuller shades, and better fabric handle with greater dyeing economy are explained.

The Vapojet Dryer employs superheated steam as the drying agent, the moisture from the fabric becoming the medium of superheated steam, which displaces all air in the dryer space. Local overdrying and avoidance of capillary movement of water-soluble dyes are important advantages of the new dryer. More responsive control in drying is effected with Eicken instruments, which measure the moisture content of textiles continuously.

INTRODUCTION

IT is interesting, and in keeping with the theme of this symposium, that much of the new machinery shown at the 1954 American Textile Machinery Exhibition in Atlantic City, N J, has been designed to produce fabrics of improved quality. We at James Hunter are happy to make our contribution to quality in the industry. We believe that those machines which we will discuss today offer the industry means of producing fabrics of improved quality, as well as at improved rates of production.

BAROTOR

Recently put into commercial practice is the Barotor, developed by DuPont to dye fabrics in open width at temperatures above the boiling point and under relaxed conditions. Several installations have been made, James Hunter having installed one at the Waldrich Company in Delawanna, New Jersey, and one at the Abbeville Mills Corporation in Abbeville, South Carolina. The Waldrich installation has been running since December 1953, the Abbeville one since March 1954. The Barotor is therefore well out of the development stage and well into the first phases of commercial application.

The Barotor is a horizontal, cylindrical autoclave, fabricated of heavy-gauge type #316 stainless steel. The fabric is mounted in open width on a stainless-steel rotor in tensionless condition. It is fed onto the rotor by means of a loading device, which both delivers cloth to the rotor and provides convenient storage for the inner bars. These are dropped into place while the rotor is slowly turning. When fully loaded, the entire rotor is run into the autoclave, and scouring and dyeing are accomplished with the rotor turning at 0.5 to 2 rpm.

LOADING———The first experimental Barotor was provided with spacer bars for each layer of fabric, and the outer bars were rotated by movement in slots provided in the rotor heads. Fortunately, these bars are no longer necessary. In today's Barotor, the outer bars are in a fixed position, although turning freely in Teflon bearings. The inner bars are locked into position at the bottom of their respective slots by retaining pins, which may be released for loading and unloading operations.

Fabrics are dyed in layers, the number of layers depending on the weight of the fabrics. Each layer is a single piece, or pieces, of about 97 yards in length. The total capacity is therefore dependent on the weight of the goods. An 11-ounce tropical suiting, 100% Dacron, is being dyed in about six layers, or about 600 yards. Obviously, control of the piece length is necessary. Other methods of loading are under consideration and study. There is hope that some of the present methods will be improved. Automatic control of the slackness of each loop and elimination of the need for control of the piece length are only a couple of the improvements which may be made in the near future.

The fabric to be dyed is made up into rolls of the proper length, one roll for each layer to be dyed. All the ends are brought together through the nip of the loading device and fastened to an outer bar. The inner bars are dropped into slots in the rotor head carrying the loops of fabric with them. Sufficient slack is fed by the operators into each loop to allow for warp shrinkage (which must be predetermined) and to allow each loop to be slack at all times. It is important that some slack remain in each loop throughout a run, since this is necessary for the fabric to progress around the rotor as the rotor turns.

DYEING———When the rotor is fully loaded, it is run into the autoclave and the dyeing cycle is begun. It is only necessary to tighten about three nuts along the bottom of the closure. Water and steam can be turned on, and the job of tightening all nuts can be done while waiting for the machine to come to temperature. It is not necessary to tighten all the bolts until pressure is desired in the machine. For those who wish to avoid the trouble of tightening nuts, a quick closure is available at extra cost.

Sampling is ingeniously arranged on the Barotor. A series of valves allows a rod to be inserted into the autoclave without loss of pressure. A hook at the end of the rod engages the sample, which is fastened to clips around the periphery of the outside rotor head. The sample is engaged by a weighted loop, which is fastened to the sample before mounting on the clip. The sample is withdrawn from the hook without loss of pressure.

A typical procedure on a 100% Dacron fabric follows:

1) Load fabric and scour if necessary.

2) Bring dyebath to 120° F and add dispersing agent and dyestuffs.

3) Raise to the boil within 30 minutes. Use a 1-rpm rotor speed to 170° F and 2- to 3-rpm speed to 212° F.

4) At 212° F add acetic acid and close the machine. Raise the temperature to 250° F in 30 minutes, and dye for one hour at this temperature.

5) Sample. If the shade is OK, continue dyeing for 30 minutes to insure levelness and penetration. If shading is necessary, add dye over 20 to 30 minutes at 250° F and dye an additional hour.

6) Scour and unload.

The entire procedure, allowing 30 minutes for loading and 30 minutes for unloading, requires a maximum of four hours, unless shading is necessary. This time cycle is practical, particularly when compared with the eight to ten hours necessary for dyeing Dacron to a full shade at atmospheric pressure. The reduced time cycle also makes savings in steam. Chemical savings alone of up to 15¢ per pound have been reported to us from the elimination of carriers.

ADVANTAGES——Darker shades, improved penetration, and increased fastness are the quality improvements made possible by the Barotor. We must also consider that, the fabric having been relaxed, the hand will be full, and the dyeing being done open-width, there will be no crease marks or "crow's feet".

Both spun- and filament-Dacron fabrics will dye to a complete range of shades without carriers. Although levelness is always a function of yarn quality, exceptional levelness is obtained in the Barotor. 100% fabrics, such a filament piques, taffetas and skip-dent shirtings have been successfully dyed. Crepes of Dacron filament in combination with rayon, and cords of Dacron and nylon have been successfully dyed. Spun Dacron tropical suitings (6- to 9-ounce), in widths up to 65", are being commercially dyed with good quality and favorable economies compared with conventional carrier methods.

Orlon 81 fabrics, such as taffetas, have been dyed by the cuprous-ion method with improved results in comparison with results over conventional equipment. Type 81 Orlon in combination with nylon in cords, shantungs and linen styles have been dyed with excellent results by both the cuprous-ion method and with basic dyes.

VAPOJET DRYER

The Vapojet Dryer by James Hunter is a significant development, which had its first general showing at Atlantic City. Commercial installations of these units have proved successful.

There has been some misunderstanding on the subject of drying with superheated steam. The Atlantic City exhibit gave an opportunity to clear this up for many people, but is is still worth explaining.

First, superheated steam is not new as a drying medium. At least 50 years ago work was being done in this field. Secondly, superheated steam is not introduced directly into the Dryer. Conventional heaters of the extended-surface type are used in the Dryer. An explanation of the operation of the Vapojet Dryer should clear up these questions.

DRYING CHAMBER——First, a description of the drying chamber: The Vapojet System is a nozzle system. The nozzles, however, are brought closer to the cloth than has been done in general practice previously, the nozzle slot being only ¼" from the cloth. Also, there are nozzles on both sides of the cloth at all times. The nozzles are 8" deep and are backed up by a plenum chamber with sufficient capacity to equalize the pressure from the high-power fans so that the vapor velocity is the same from all nozzles. The slots in each nozzle are only ⅛" wide, with the result that vapor velocities are approximately 6,000 to 7,000 feet per minute.

Now, when the Dryer is started up, steam is turned on in the extended-surface heaters, the fans are started up, and the Dryer is brought up to temperature. 100-pound line pressure is desirable to give temperatures of 300°F in the Dryer, although slightly lower pressures have been successfully used. Once temperature has been reached, an open steam line is turned on to introduce live steam at atmospheric pressure into the Dryer chamber. This steam gradually forces all the air out of the Dryer, leaving a vapor atmosphere. This vapor (at 212°F) is passed over the heaters and is superheated to 300°F. Once wet cloth has started running into the Dryer, the open steam line is turned off, the wet cloth being the source of supply of water vapor for superheating. Airlocks at the entering and exit end of the Dryer chamber prevent air from entering the Dryer and excess steam from bleeding into the room.

When currents of warm or hot air circulate around the fabric in a conventional dryer, moisture is absorbed by the warm air from the surface fibers of the fabric. Moisture from the inside of the fabric works to the surface by capillary action where it, in turn, is evaporated. If the water in the fabric is carrying soluble materials, such as dyestuffs or resin monomers, these materials will be carried to the surface by the capillary movement of the moisture and deposited thereon.

It is also true that fabrics are frequently overdried in a hot-air Dryer, since some part of the fabric must be overdried in order that all of the fabric be dried.

With the Vapojet System, superheated steam is impinged on the wet fabric at velocities of 6,000 to 7,000 feet per minute. This superheated vapor, blown over and into the fabric, quickly raises the temperature of the liquid in the cloth to the boiling point. Heat is given up to the cloth moisture by radiation and also through the superheated vapor condensing on the cool surface of the cloth, whereby the latent heat of vaporization is transferred to the fabric. Thus, the liquid contained in the fiber, as well as the surface liquid, is converted to vapor, and drying is accomplished throughout the fabric rather than by capillarity to the surface. Soluble matter carried by the liquid in the cloth is therefore deposited inside the fibers rather than on the surface. In addition, the cloth is never overdried with superheated steam, since a slight amount of the vapor is carried in the cloth as it leaves the Dryer. This vapor condenses at room temperature and provides a slight conditioning effect, so that the fabric is never overdried.

The efficiency of the Vapojet Dryer is obtained by the combination of superheated steam and the high velocity at which the superheated vapor impinges on the fabric. This high velocity is obtained by means of the very narrow slot in the nozzle and by the closeness of the nozzle opening, which is only ¼" away from the fabric. When the system is applied to tenter frames, telescopic nozzles are used, so that the nozzle can be placed within the frame rails to maintain this closeness to the fabric.

In using air as a drying medium, it is necessary to heat the air, which enters the Dryer at room temperature, from approximately 70 to, let us say, 300°F. The air is then blown through or over the fabric and is then exhausted or thrown away. Fresh air is drawn into the Dryer and is heated to temperature. When superheated steam at 300°F is blown through the fabric, a temperature drop of 88° occurs, and vapor at 212°F is reheated to 300°, so that the heating coils have only to replace 88° instead of 230° as with air.

The following then summarizes the advantages of a Vapojet Drying System:

1) Dries by raising the temperature of the impregnating liquid almost immediately, which is removed from the cloth as vapor.

2) No capillary action occurs, thus no migration.

3) By excluding air, eliminates oxidation of fibers or dyestuffs.

4) Eliminates overdrying.

5) High velocity insures even drying across the width.

6) Reduces over-all operating costs; saves floor space and steam used per hour.

When fabrics are resin-treated on a Vapojet range, the resins are held inside the fibers and do not form on the surface to give a harsh hand.

Two types of Vapojet Dryers are available to the trade. The system may be applied to any Straightaway Tenter Frame of the horizontal type. A tensionless roller dryer can be had, where the fabric is supported by small-diameter, driven rollers, whose surface speed may be varied in relation to the delivery speed of the dryer, to allow the cloth to run with any desired tension, or lack of tension.

OTHER NEW DEVELOPMENTS

OVERFEED FOR TENTER FRAMES ——We should not overlook the Hunter overfeed and overfeed clip for tenter frames. These make overfeeding practical on a clip-type frame, and, when combined with the Vapojet System of drying, make the ideal machine for resin application, or the application of chemicals for dimensional stability, such as in the Avcoset process, or, indeed, wherever control of both warp and filling tension is desirable.

CONTINUOUS MOISTURE MEASUREMENT IN TEXTILES ——The new Eicken System Instruments for measuring moisture, introduced by James Hunter at Atlantic City, have created a lot of interest. The psychrometer makes possible, for the first time, practical automatic control of moisture in fiber, yarn, or fabric. This control is obtained by merely setting the instrument for the desired degree of moisture in the fabric, and the instrument then will regulate the speed of the dryer to deliver that percentage of moisture. This is done without any need for recalibration of the instrument for changing weights or qualities of fabric. One setting of the instrument suffices.

Recording-controlling, indicating-controlling, or simple indicating instruments will be available. Moisture in the fabric is detected by three rollers placed one at each side and one in the middle of the fabric. The instrument thereby measures the moisture across the piece, and drying speed is regulated by the wettest section.

When a machine stoppage occurs, causing overdrying in that portion of the goods stopped in the dryer, an automatic delaying circuit is fitted to insure that overdried material is clear of the machine before the instrument again commences to control.

These psychrometers allow the production of fabrics with controlled moisture content. One result is that no fabric need be overdried, with the expected improvement in fabric quality. Since it is not necessary to bone-dry a fabric to be sure that it is dry, the drying speed is almost invariably increased.

At least one other advantage will result from these instruments. With three sensing rollers, it is a simple matter to measure quickly the degree of moisture at both the sides and the middle of a fabric. Any unevenness in drying can be quickly detected, and an investigation started to determine the causes.

The hygrometers offered are unique in that they can measure humidity from minus 94°F to plus 570°F. Of interest to finishers, then, is their application to air dryers. When installed as controllers, the exhaust valve on the dryer can be controlled to maintain a constant and proper humidity in the dryer. Since less fresh air will be drawn into the dryer, significant steam savings usually result.

These instruments will be in production in the United States in the near future, and are sure to be of interest to all finishers.

MANGLES——Only three items are reported on in detail here. A new German Mangle is being offered which, by means of small-diameter rollers, gives remarkably low water-extraction figures. A Belgian Mangle, utilizing a similar principle, will probably be available in this country also.

CONCLUSION

Although increase in production is an important feature of the machines discussed here, you will note that fabric quality is also a factor in every case. There is no question that our consuming public is becoming more quality conscious all the time. They are also becoming more and more able to judge quality.

The AATCC research program, through the study and design of improved testing methods, makes a heavy contribution toward improvement of quality in the industry. It is not just the design of methods to check quality, but a quality mindedness that is developed through constant discussion and meetings such as this one. The Association is to be congratulated in its research effort. May it continue to be "the key to quality"!

IV. TRADE-NAMED FINISHES AND WHAT THEY STAND FOR

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Salisbury, N C

A quality control manager presents a plea for an appreciation of the great value of trade-marks for special finishes in merchandising textiles. Many important trade-named finishes are discussed to illustrate the argument. Something of the technology, properties, and testing involved for each specific finish is explained to show how the reputation of a trade-mark is established. The use of AATCC testing methods in such development is emphasized by the author.

INTRODUCTION

I HAVE selected as the subject for my paper "Trade-Named Finishes And What They Stand For", because today our customers, ultimate consumers, are demanding quality and value in textiles. This is in addition to style and appearance, and, what's more, they demand proof of quality and value too. It is this ever-increasing demand of "It must look good and must perform just as well as it looks" that is, in a large measure, responsible for the "Trade-Named Finish" trend. It's a good trend too, because these trade-named finishes require *Precise Workmanship* to meet a *Standard*.

Let's spend a little time in examining this *precise workmanship* and *standard* angle. What is *Workmanship?* Well, *Workmanship* is defined as "the quality imparted to anything in the process of making", and *Precise* is defined as "minutely exact, not varying in the slighest degree and conforming strictly to a *standard*". Now then, let's get at the big and important word, *Standard*. It is defined as "that which is set up and established by *authority*, custom or general consent, as a rule, model or example for the measure of value and quality". It is therefore very evident that trade-named finishes are quite a bit more than just a registered mark or name.

The real value of trade-named finishes is that they comply with definite consumer end-use requirements and they have been developed and are advertised as adding a value or quality to a fabric which is not inherent in the fiber itself. This added value or quality is a requisite, and it is responsible for the many trade-named finishes on the market today. I'm going

to tell you what some of these trade-named finishes do to fabrics and how they improve their value. I can't go into much detail about any one of them because of the limited time alloted to me, and I can talk about only those finishes with which I have become familiar through my daily contact in my plant's application of them.

IMPORTANT EXAMPLES

Let's start with one of the oldest trade-named finishing processes with which everyone here is certainly familiar, *Sanforized*. Sanforizing is a controlled shrinkage process which mechanically rearranges the yarns of a fabric, by compressive action, to the extent that they are shortened as much as they would be if laundered. This process is extensively used on cotton goods, and to a lesser degree on others, and fabrics so treated have a residual shrinkage of less than 1% in length or width according to a standard wash test. This is the test: A specimen of fabric at least 20 inches square, on which an area of 18 inches, warp and filling, has been indellibly marked, is placed in a reversing wash wheel with water at 212°F and a sufficient amount of chip soap to give good running suds. The wash wheel is kept running continuously for 60 minutes from the start of the test, the specimen is removed from the wheel, excessive moisture is squeezed out, and then the specimen is placed without tension on a flat bed press for drying. It is then measured to determine exact shrinkage. So you see, fabrics which are trade-marked Sanforized are given such a severe laboratory end-use predictive test that they can be marketed as really and truly shrinkage-controlled.

Tebelized is another brand-named finish with which most of you are familiar. Tebelized is the trade-mark of the T B Lee Company and means "Tested Crease Resistant". Crease resistance, as you know, is the term used to describe fabrics that have been treated so as to have the property of not creasing easily. The usual method of imparting crease resistance is to impregnate fabric with a certain amount of some synthetic resin, either urea-formaldehyde or melamine-formaldehyde. After proper application of resin the fabric so treated is required to meet a certain percent recovery from wrinkles, a certain degree of durability, and to possess high resistance to abrasive wear.

There are six separate tests required of fabrics to gain approval as Tebelized. *First*, they must be crease resistant, and to determine to what extent, they are tested on a special apparatus designed and supplied by T B Lee Co. An average of four test strips, both warp and filling, is recorded, and the recovery value must meet T B Lee's minimum requirement, established by experience, according to the type, weight and construction of the fabric. *Second*, the fabric is tested for resistance to abrasion. *Third*, a tensile strength test is made, and, *Fourth*, a tear test. *Fifth*, a test to determine free formaldehyde, which is a precautionary test to assure against the development of amine odors. *Sixth*, and this is really important, a test is made to determine the degree of resin fixation. If resin has not been carefully and properly applied, it can be removed in a few launderings. If the treated fabric meets all these test requirements, it may be labeled as Tebelized. Only fabrics that have been tested and approved by the T B Lee laboratories are eligible to be identified as Tebelized. Any fabric passing these tests and bearing the Tebelized mark is most certainly one which will stay sold and will render excellent consumer performance. It is also altogether possible that it will mean repeat sales for the converter and garment manufacturer.

Permel Plus as a trade-marked finish has earned high industry regard. It imparts on rayons, synthetics and blends a durable finish with good crease-recovery properties, water repellence, together with a spot repellence that resists nonoily stains. The plant application of Permel Plus is similar to the previously described crease-resistant process, but the end result is not only a crease-recovery property but a water and spot resistance as well. Fabrics treated with this application are tested for angle of recovery (crease resistance) as well as for water and spot repellence. Laboratory tests have indicated a higher resistance to abrasive wear on fabrics so treated. That's because Permel Plus has excellent lubricating qualities. Permel Plus fabrics are really given a stiff test. They have got to meet the same rigid crease-resistant tests that were briefly described as requisite for the Tebelized mark of approval, and in addition they must pass a spray-rating test. This test is made to measure the resistance of fabrics to wetting by water. To be assured of good consumer performance this test is repeated after three dry cleanings and after three washings. In addition, the crease-angle test is repeated after three dry cleanings. Fabrics treated so as to meet these rigid test requirements are certainly going to give no one any trouble; in fact, the exact opposite is true, Permel Plus fabrics will sell, stay sold and bring repeat business because they are processed to please the consumer.

Hydro-Pruf is a more recent addition to our family of trade-marked finishes. It is the trade-mark of the Arkansas Co and refers to a durable silicone water-repellent finish that produces an exceptionally high spray rating on many types of fabrics. It imparts a finish that withstands numerous washings and dry cleanings without substantial loss of water repellency, and this is how it is tested: The test specimen, which has been conditioned, is fastened securely in a 6-inch metal hoop so that it presents a smooth wrinkle-free surface. The hoop is then placed on the stand of the spray tester so that the fabric is uppermost in such a position that the center of the spray pattern coincides with the center of the hoop. A measured quantity of water at 80°F is poured into the funnel of the tester and allowed to spray onto the test specimen for approximately 20 to 30 seconds. After this period of wetting, excess water is tapped off the hoop, the wet or spotted pattern is compared with a rating chart, and the specimen is rated corresponding to the nearest standard in the rating chart. These tests also are repeated after three launderings at 120°F and after three dry cleanings.

Hydro-Pruf is a good name, owned by a good company and is made with a good chemical. These three, together with good finisher application, add up to an exceptionally good water-repellent fabric.

Zeset is a trade-marked finish by Du Pont that is capable of producing crease resistance and shrink resistance on fabrics composed principally of cellulose fibers. It has excellent durability, softness, fullness of hand, and a high degree of resilience. It is applied in the same way any other crease-resistant resin is applied. The finished fabric will test well for angle of recovery, low chlorine retention and durability to dry cleaning with plain solvent or with solvent plus dry cleaning soap. Zeset properly applied will meet the same test for crease resistance described for Tebelized fabrics. This test, too, is repeated after three launderings at 120°F and three dry cleanings. Zeset is a type of resin finish which results in rather a low chlorine retention. This is a really important factor on fabrics sold as washable. Proper application of Zeset results in a fabric with good shrinkage stability.

Zelan is another trade-marked finish by Du Pont and one which is familiar not only to members of our industry but to just about every consumer in the United States. I'm certain I shall not be able to say anything about Zelan which you do not already know. Therefore, I'll just say that Zelan is a durable water repellent that gives excellent initial water repellency, and it retains this repellency through numerous launderings and dry-

cleaning operations. The test procedure used to determine Zelan effectiveness is similar to the water-repellency procedures described for Permel Plus and Hydro-Pruf. The spray ratings, initially and after three launderings and three drycleanings, must meet the high standard set by the Du Pont Company. These tests are performed not only by the applying finisher but by an impartial laboratory designated by Du Pont. Only fabrics which meet all these test requirements may be identified and sold as Zelan-treated. No water repellent fabric could possible have a better handle than Zelan, and all of your customers are aware of this fact.

Vatruset is North Carolina Finishing Company's trade-name for rayon fabrics that have been dyed and finished so as to meet a high standard of washability. As the name implies, fabrics which bear the Vatruset seal have been vat-dyed so as to assure absolute colorfastness to laundering, and they have been set or stabilized to assure a shrinkage not in excess of 2%. Colorfastness tests and shrinkage tests are made in accordance with Commercial Standards CS59-44. The colorfastness requirement is Test Number Three, which is made at 160°F with 0.5% neutral soap and 0.2% sodium carbonate. The specimen is run for 45 minutes and after drying shall show no appreciable change in color and no appreciable staining of the white test cloth. The shrinkage test is the same rigid one made for Sanforized fabrics, which, you will remember, is made at 212°F. Fabrics identified as having been Vatruset-processed may be sold without any hesitation as washable.

Avcoset is American Viscose Corporation's trade-mark for fabrics that have been processed in accordance with the formulation and requirements constituting the Avcoset program. Avcoset fabrics are dyed to meet a 160°F wash-fastness test, and they are finished with a cellulose ether (the same basic material from which rayon is made). This Avcoset cellulose ether impregnates the fiber, where it combines chemically, forming a permanent bond with the rayon, and this results in a shrinkage control which is as permanent and lasts as long as the fiber itself. Shrinkage tests are made according to CCC-T-191a cotton procedure, which is at 212°F. This is again the same test requirement described for Sanforized and Vatruset finishes. Avcoset fabrics are also nonchlorine retentive. This means that they may be washed "any way you like", and no special washing instructions are necessary.

Avcoset, as you may know, is presently presenting it's quality-control program to the consumer in an extensive magazine advertising campaign. Avcoset fabrics are being introduced to the consumer as good, serviceable rayon fabrics of permanent washability.

Impregnole is Warwick Chemical Company's trade-name for a renewable water-repellent finish. It is a wax emulsion, and its proper application results in an exceptionally high spray rating. This spray rating test is the same one previously described for Permel Plus and Hydro-Pruf. This test procedure is made only on the initial application. It will not stand up after laundering or drycleaning.

Superset is the trade-named finish which renders cotton fabrics wrinkle-resistant, and it also imparts shrinkage control and durability against washing and drycleaning. Superset fabrics must meet the same crease-recovery test requirement previously described for other crease-resistant finishes. Because Superset is a shrinkage-control finish, fabrics so treated must pass the 212°F shrinkage test that is used for Sanforized fabrics.

After Superset fabrics have been subjected to this wash test, the crease-recovery test is made again. This is really insurance that, even after repeated launderings, the finish application, which is a combination of a thermosetting and a thermoplastic resin, will still be effective as a wrinkle-recovery agent. Superset is a carefully policed and checked process, and fabrics bearing the Superset seal are really washable without apology because they are colorfast, nonchlorine retentive, shrinkage controlled and crease resistant.

Everglaze is one of those trade-named finishes which can best be compared to a well-cut diamond it has so many facets. It would be difficult in the short time alloted me to even begin to describe all the many things that the name Everglaze may mean to a fabric. Some of the more popular applications and those with which I am familiar because of my plant application experience are as follows.

1) Permanently embossed patterns and finishes that are washable and durable.
2) Shreiner finish, which imparts a deep-seated, durable, washable luster.
3) Chintz finish, which imparts a durable and washable mirror-like luster.
4) Calendered finish, a medium-smooth and bright finish, which is also durable and washable.

Regardless of which type of finish is applied, all Everglaze fabrics are tested for crease resistance, shrinkage, breaking strength, and tear strength. For some finishes a flex abrasion test is also made. In addition to this assortment of tests, a colorfastness wash test is added. Fabrics identified with the Everglaze mark are truly washable, colorfast, and shrinkage-controlled.

I could go on for a few more hours, naming and describing many other trade-named finishes, with some of which I am familiar, and many more with which I have not had experience in application.

IMPORTANCE OF TEST METHODS

You will have noticed, even in my brief description that all of the trade-named finishes are designed and engineered to meet certain end uses, and you will have noticed, too, that their performance is always measured by a laboratory test procedure. It's an easy job just to apply chemical finishes, but its an altogether different matter to apply them accurately and precisely so as to comply with requirements measured by a test procedure in a laboratory.

Trade-named finishes require just this sort of correct handling to assure you and your customers that the advertised end-use properties have been finished into the fabric. What's more, every finish I mentioned today is tested not only in the finishing plant's laboratory, but it is also checked and policed by an outside laboratory designated by the owners of the finish trade-mark.

Earlier in my paper, I stated that trade-named finishes owe much of their acceptance to the consumer demand that "It must look good and perform just as well as it looks". That's a true statement to which I have to add that trade-named finishes are meeting this consumer demand because of applied research. I think that, right here and now, I should say something about the sponsors of this great symposium, the American Association of Textile Chemists and Colorists. I shall not tell you how their research efforts have helped provide our industry with auxiliary products that satisfy a consumer requirement. No, this Association does not produce chemical products, nor does it recommend the production of certain products. It does a much more important research job; it pinpoints fabric and fiber deficiencies that may be caused by construction, dyeing, finishing or printing and then develops a scientific test procedure which measures the ability of a manufacturing or dyeing process to overcome the deficiency or to improve a fabric so that there can be no cause for customer dissatisfaction. Only after the development of test procedures which indicate expected fabric performance can special remedies or improved finishing chemicals or materials be engineered and produced.

Because of AATCC research efforts, which have provided industry with just about all of the test procedures I have mentioned, I can say that you can't go wrong with laboratory-tested trade-named finishes.

1954 Intersectional Contest
2nd Prize Winner——

THE EFFECT OF VARIOUS SOFTENERS ON A RESIN-TREATED VISCOSE RAYON FABRIC*

PIEDMONT SECTION

EDWARD A MURRAY,
Chairman and Speaker
Consultant

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I INTRODUCTION

THE application of softeners to resin-treated fabrics for the improvement of hand and draping qualities is nearly as common an operation in textile finishing today as the resin treatments themselves. The effects of softeners on fabric properties generally has received little attention in the published literature, however. Nitschke *(8)* has described principles of softener treatments, Wagner *(14,15)* has studied the effects of various finishing agents on the serviceability of rayon shirting fabrics, while Gruntfest and Gagliardi *(4)* have reported the effects of a single softener on the wrinkle recovery of a resin-treated rayon material. By far the largest proportion of literature references in the textile softener field, however, are patents disclosing compositions recommended for the purpose. These shed little light on the properties of the finished textile.

In many applications of urea-formaldehyde finishes to rayon fabrics for shrinkage control and crush resistance, it is customary to include a softener in the formulation. This technique considerably improves the permanance of the softener to laundering, and in instances where the fabric is to be softener treated, softener and resin are usually applied simultaneously. Not infrequently, however, additional softener must be applied after resin treatment to correct undesirable stiffness which occasionally remains, despite the finisher's best efforts to produce a full, "mellow", hand.

The experiments described in this paper were undertaken in order to study the effects of softeners of varying chemical type (ie, ionic nature) on several properties of a resin-treated viscose rayon fabric, both before and after laundering.

To include all of the available commercial softeners, or even a representative sampling of them, in these studies would have made the task impractically long. Because members of a given class vary widely in chemical composition, their behavior probably varies considerably also, thus making it difficult to select a few members of a class which could be considered representative with any degree of certainty. To further complicate the selection problem, the composition of many commercial products is either indefinite, secret, or both. It seemed quite unlikely, therefore, that a project of reasonable scope could lead to generalizations applicable to the effects of all softeners.

The selection dilemma was resolved by confining the present studies to four products, one from each of the four classes. They were as follows:

Although it is customary to include a softener in conventional alkali-formaldehyde resin treatments for improving crease resistance and reducing laundering shrinkage in viscose rayon fabrics, it is often necessary to correct undesirable harshness after resin application by further softener treatments. The studies described in this paper were undertaken in order to evaluate the effect of the ionic nature of the softener on fabric physical properties.

A single piece of spun viscose gabardine shirting was treated at several concentration levels with each of the following softener types: nonionic, anionic, cationic, pyridine. The effect of the softeners was evaluated both before and after laundering.

While it is not possible to make broad generalizations regarding different classes of softeners on the basis of results obtained with a single member of a given class, some interesting differences in physical properties of the fabrics attributable to softener type were found. Only the cationic and pyridine softeners produced major changes in fabric hand. Stiffness changes in the softener-treated materials, moreover, were detectable only at the higher concentrations of the pyridine softener. Measurable effects due to softener treatment were found in tear strength, flat abrasion resistance, sewability, and coefficient of friction.

* Presented by Edward A Murray at the Atlanta Biltmore Hotel, Atlanta, Ga, on Sept 18, 1954.

Chemical Type	*Description*	*Trade Name*
Nonionic	Blend of polyoxyethylene derivatives of glycerides and fatty esters of sorbitol anhydrides	Avcosol 104
Anionic	Sodium salt of a long-chain hydrocarbon sulfonate	Avitone A
Cationic	Stearyl dimethyl benzyl ammonium chloride	Triton K-60
Pyridine	Long-chain quaternary ammonium complex	Zelan AP

Since the work described in this paper is based on a single representative of each chemical class, the conclusions drawn are specific for the studied products, and not general for the classes represented. The methods employed, however, and the comparisons made, should be generally applicable, and might be of considerable value in softener selection, where properties in addition to hand are of importance.

To limit variations in physical properties to those produced by the softeners themselves, it was decided to omit softener from the original resin treatment and to apply all of the softeners as aftertreatments. All of the experiments herein reported were performed on samples from a single piece of a spun, all-viscose, rayon gabardine shirting material, treated with a conventional urea-formaldehyde resin in a commercial finishing plant.

II EXPERIMENTAL

A. RESIN TREATMENT——Since it was thought to be representative of suiting materials which are ordinarily urea resin treated for crush resistance, a single piece of a spun all-viscose gabardine shirting of the following construction was employed in this investigation:

Yarn numbers	
warp	20
filling	20
Construction	100 x 50
Width——inches	46
Grey weight——yards per pound	2.17

Sixty yards of the fabric was padded with a solution containing 16 percent of a conventional urea-formaldehyde condensate used for rayon finishing and 2 percent of an organic salt type catalyst. The fabric was dried for approximately one minute at 275°F, and cured for approximately 8 minutes at 300°F. Following curing, the treated material was scoured in rope form to remove uncured resin, framed to width, and dried.

B. SOFTENER APPLICATION——Each of the softeners was applied at the appropriate concentration to give approximately 0.5, 1, 2, and 4 percent softener, "as received," on the fabric. The dispersions, prepared as indicated in Table I, were applied with a Butterworth 10-inch laboratory padder, using a single dip and single nip.

In order to confine changes in physical properties to those produced by the softeners themselves, all of the fabric samples were processed similarly in the softener application step. Only the pyridine softener required curing, but all of the other specimens, including the unsoftened control sample, were given the same curing cycle. After curing, in accordance with manufacturer's recommendations, the fabric treated with pyridine softener was given an alkaline scour to neutralize it, as noted in Table I. To avoid premature softener removal, the other samples were not scoured.

To estimate the actual concentration of softener applied, each fabric sample was weighed before and after padding. From the pick-up determination and the concentration of material in the dispersion being padded, the actual concentration of softener applied was calculated, assuming that selective absorption of the softener did not occur under the application conditions. These estimated concentrations are given in Table II.

C. LAUNDERING——Following the softener application, one half of each sample was laundered in accordance with AATCC Test Method 14-53 *(1)*, modified by lowering the temperature to 160°F. This test is rather widely used for shrinkage determination in resin-treated viscose fabrics.

D. PHYSICAL TESTING——All physical tests were conducted at 70°F and 65 percent relative humidity, after conditioning for at least 12 hours, except as noted. The tests performed are listed below. Some of the less common procedures are described in the Appendix.

Test	*Test Method*
1) Hand	Subjective—See Discussion
2) Stiffness	Saxl Method *(11)*—See Appendix
3) Sewability	Cluett, Peabody needle-cutting test—See Appendix
4) Tear strength	Federal Specification CCC-T-191b (3) Test Method 5132
5) Crease resistance	AATCC Test Method 66-53 (2); also TBL Method *(10)*
6) Flat abrasion resistance	Federal Specification CCC-T-191b (3) Test Method 5302
7) Flex abrasion resistance	Federal Specification CCC-T-191b (3) Test Method 5300
8) Roll and break	See Appendix
9) Coefficient of friction	See Appendix
10) Tensile strength	Federal Specification CCC-T-191b (3) Test Method 5104

TABLE I
SOFTENER APPLICATION

Preparation

1) *Nonionic*——The required amount of softener was dispersed in water heated to 150° F.
2) *Anionic*——The required amount of softener was dissolved in water at 140-160° F.
3) *Cationic*——The required amount of softener was dissolved in an equal volume of water at 160-180° F. and diluted.
4) *Pyridine*——The required amount of softener was added to one half the final volume of water at 120° F; 4/5 of the remaining water was added cold. The solution was thoroughly mixed and sodium acetate equal to 1/6 the weight of softener was dissolved in the remaining warm water and added to the dispersion.

Fabric Treatment

All of the softener dispersions were applied with a 10-inch Butterworth laboratory padder, using a single dip and a single nip. Application temperatures are given below:

Softener	*Application Temperature—°F*
control (water)	120
nonionic	150
anionic	120
cationic	120
pyridine	95

Following the padding step, all of the fabrics were dried at 250°F, and cured for 4 minutes at 350° F. In accordance with manufacturer's instructions, the pyridine-treated samples were neutralized after curing by scouring for 10 minutes at 140°F in a solution containing 0.1 percent Triton X-100 and 0.25 percent soda ash, based on the weight of the goods. They were then rinsed thoroughly and dried. Because some of the other softeners might have been partially removed in this step, it was omitted for all of the remaining specimens.

III DISCUSSION

A. RESIN RETENTION AND SHRINKAGE——Softeners do not ordinarily affect the permanence of urea resin finishes; their utility would be severely limited if they did. As a matter of interest, however, it was decided to check resin retention of several fabric samples, including the material treated with 2 percent cationic softener. Resin retention tests are reported in Table III, and were made in accordance with a slightly modified Rohm and Haas procedure, as noted. Results indicate that the resin retention was not affected by the 2 percent cationic softener application. Since the order of resin retention found in the tested samples was quite high (86 to 93 percent), it seemed likely

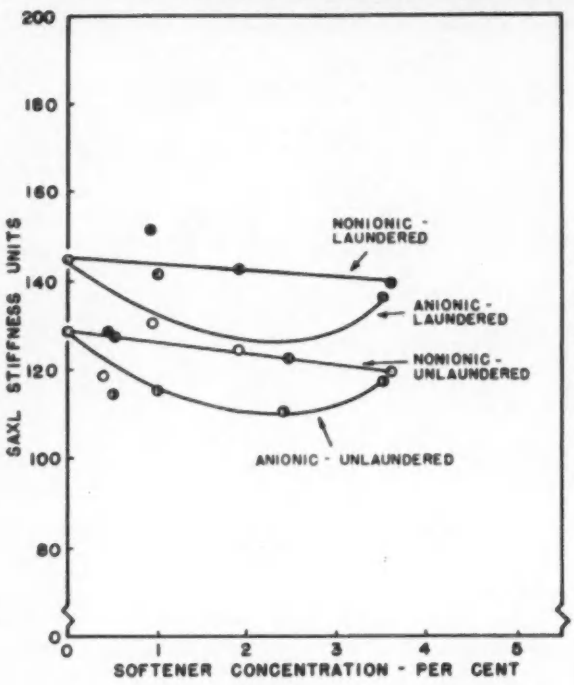

Figure 1
Effects of nonionic and anionic softeners on Saxl stiffness

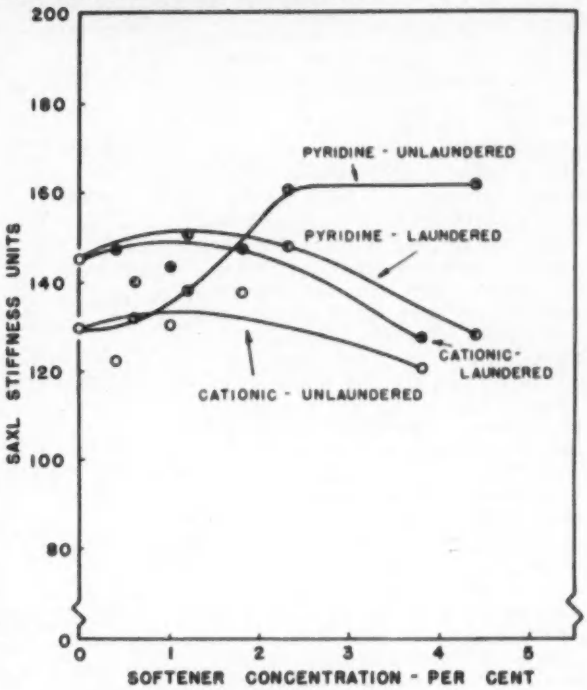

Figure 2
Effects of cationic and pyridine softeners on Saxl stiffness

TABLE II
ESTIMATED CONCENTRATIONS OF SOFTENERS IN TREATED FABRICS

Nominal Concentration—Percent	*Calculated softener concentration, Percent*[a] 0.5	1.0	2.0	4.0
Nonionic	0.4	0.9	1.9	3.6
Anionic	0.5	1.0	2.4	3.5
Cationic	0.4	1.0	1.8	3.8
Pyridine	0.6	1.2	2.3	4.4

[a] Based on air-dry fabric.

TABLE III
RESIN RETENTION AND FABRIC SHRINKAGE

Resin Analyses[a]

Sample	*Resin concentration—Percent of oven dry original fabric* Total	Fixed	*Resin retention—Percent*
Unlaundered control	12.2	10.4	85
Laundered control	10.8	10.0	93
Unlaundered sample, treated with 2 percent cationic softener	11.3	10.3	91
Laundered sample, treated with 2 percent cationic softener	11.8	10.1	86

[a] The general procedure outlined in the Rohm and Haas Technical Bulletin *(10)* was followed except that a 100/1 bath was used for both the hydrochloric acid and sodium carbonate treatments. Samples were held in the acid bath at 175°F for 25 minutes.

Fabric Shrinkage

Condition of fabric	*Yarns per inch* Warp	Filling
Before resin treatment	100	50
After softener application	103	51
After laundering	102	52

that the other softeners would not greatly reduce resin retention. Accordingly, resin retention tests on the remaining samples were omitted.

Laundering shrinkage tests were confined to pick and end counts, also given in Table III. These were found to be identical for all of the treatments with approximate changes of a 1 percent gain warpwise and a 2 percent shrinkage fillingwise after one laundering. Fabric shrinkage was not altered by any of the softeners, and no corrections for these small dimensional changes were made in comparing the physical test data on unlaundered and laundered specimens.

B. HAND———The tactile characteristics of the samples were evaluated by three experienced persons; a department store buyer, a wholesale merchant, and a finishing plant supervisor. They were in agreement on the following points:

1) Before laundering, only the pyridine softener treatments produced noticeable changes in fabric hand. The control specimen was only slightly harsher, if at all, than those samples treated with the nonionic, anionic, and cationic types. The material treated with 4 percent of the pyridine softener was slightly softer than the samples treated at the lower concentrations.
2) Laundering reduced the stiffness of all samples.
3) After laundering, fabrics treated with pyridine softener were softer than the others,

but no concentration effects were noticeable.

4) There were no apparent differences in hand among the remainder of the samples after laundering.

C. STIFFNESS———While no simple relation exists between fabric hand and stiffness, Hoffman and Beste *(7)* have pointed out that it is an important component of hand. It is of interest to note that there was a close qualitative correlation between some of the subjective evaluations of hand and the results of stiffness tests. Stiffness data appear in Table IV, and are depicted graphically in Figures 1 and 2.

Before laundering, only the samples treated at the 2 and 4 percent Pyridine softener concentrations were appreciably less stiff than the control fabric. In the unlaundered state, the anionic softener increased stiffness slightly over the control fabric, while the nonionic and cationic treated specimens exhibited essentially the same stiffness as the control. These observations are in agreement with the conclusions concerning hand.

Following laundering, stiffness of most samples was reduced, and this also agrees with the findings with respect to hand. There is one exception, however; in the case of the pyridine softener at the higher applied concentrations, laundering actually *increased* the stiffness. This result was unexpected and was not apparent in the assessment of hand. The reductions in stiffness encountered in laundering brought all of the samples to roughly the same stiffness level, and it is perhaps for this reason that the stiffness increase in the pyridine softener treatments was not detected in the hand evaluation.

D. SEWABILITY———The results of sewability tests are given in Table V. It will be noted that, in the unlaundered condition, the cationic softener appears to give the best overall performance. The nonionic material was best, however, at the 0.5 percent concentration. Increasing the softener concentration, moreover, generally improved sewability.

Since sewability is a measure of the capacity of the component yarns of a textile to deform and be pushed aside by the needle, it is hardly surprising that mechanical working of the fabric, as in laundering, usually improves sewing characteristics. The failure of the specimens treated with anionic softener at the 1 and 2 percent concentration levels to respond to the laundering treatment is less readily understood, and has not yet been explained.

Samples treated at the highest softener concentrations all gave perfect performances in the sewing test after laundering. Considering all sewability tests, the cationic softener was most efficient, the nonionic and pyridine products approximately equal, and the anionic softener least effective.

E. TEAR STRENGTH———All softeners improved the tear resistance of unlaundered samples. Treatment of fabrics with crease-resistant finishes usually reduces elongation, and this property has been shown by various investigators, *(5, 6, 12)* to be of considerable importance in tear strength, abrasion resistance, and flexural endurance properties. The application of lubricants, therefore, which tends to increase elongation, might be expected to improve tear resistance.

The behavior of fabrics treated with the anionic softener was quite different from that of the other samples, as will be apparent from an examination of Table VI and Figures 3 to 6 inclusive. In contrast with the other softeners, the anionic material showed no maximum in-

TABLE IV

EFFECT OF SOFTENERS ON FABRIC STIFFNESS

Nominal Softener Concentration—Percent	Saxl Stiffness[a] 0	0.5	1.0	2.0	4.0
0.5-Gram load					
Before laundering					
Control	156	—	—	—	—
Nonionic	—	156	159	143	147
Anionic	—	130	152	130	137
Cationic	—	158	145	153	157
Pyridine	—	164	178	b	b
0.25-Gram load					
Before laundering					
Control	129	—	—	—	—
Nonionic	—	119	131	125	120
Anionic	—	115	116	111	118
Cationic	—	122	130	136	120
Pyridine	—	132	138	161	162
After laundering					
Control	145	—	—	—	—
Nonionic	—	129	152	143	140
Anionic	—	128	142	123	137
Cationic	—	147	143	147	127
Pyridine	—	140	151	148	128

[a] All measurements made in warp direction. Saxl stiffness readings increase with decreasing fabric stiffness.

[b] Too soft for reading at this weight.

TABLE V

SEWABILITY OF SOFTENED FABRICS[a]

	Number of yarns cut in 2 inches Unlaundered	Laundered	Percent cut yarns Unlaundered	Laundered
0.5 Percent softener				
Nonionic	0	0	0	0
Anionic	13	2	12.5	1.9
Cationic	2	0	1.9	0
Pyridine	1	0	0.9	0
1.0 Percent softener				
Nonionic	1	0	0.9	0
Anionic	7	7	6.7	6.7
Cationic	0	0	0	0
Pyridine	1	0	0.9	0
2.0 Percent softener				
Nonionic	3	1	2.8	0.9
Anionic	3	3	2.8	2.8
Cationic	0	0	0	0
Pyridine	2	0	1.9	0
4.0 Percent softener				
Nonionic	0	0	0	0
Anionic	3	0	2.8	0
Cationic	0	0	0	0
Pyridine	0	0	0	0
Control	14	3	13.4	2.8

[a] Sewability was tested for filling only. (Seams were sewed in the warp direction).

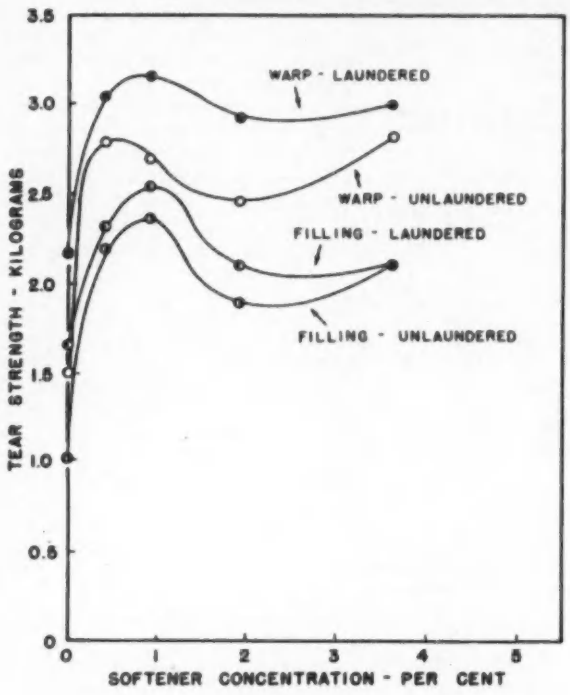

Figure 3
Effect of nonionic softener on Elmendorf tear strength

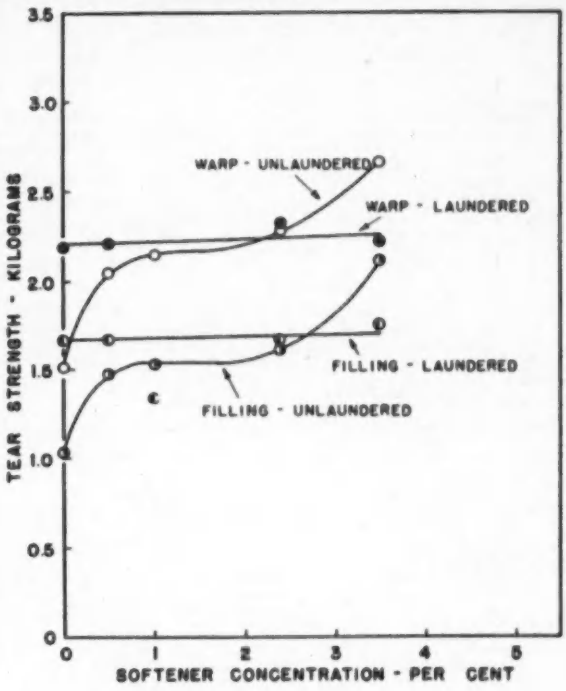

Figure 4
Effect of anionic softener on Elmendorf tear strength

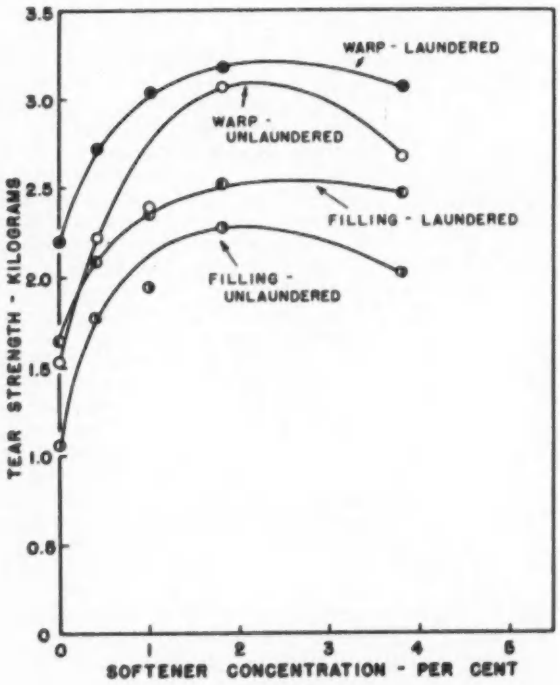

Figure 5
Effect of cationic softener on Elmendorf tear strength

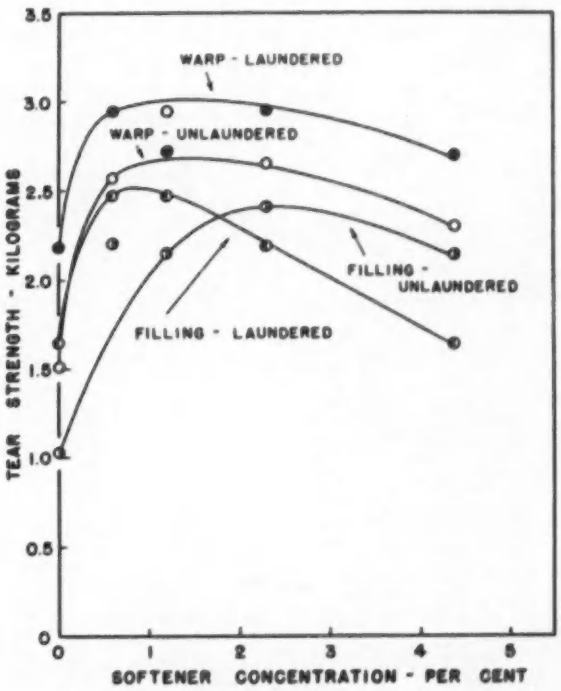

Figure 6
Effect of pyridine softener on Elmendorf tear strength

TABLE VI
INFLUENCE OF SOFTENERS ON FABRIC TEAR STRENGTH

Nominal softener concentration—Percent	0		0.5		1.0		2.0		4.0	
	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling
	Elmendorf Tear Strength[a]—Grams									
Unlaundered										
Control	1504	1042								
Nonionic			2816	2240	2726	2368	2464	1888	2848	2112
Anionic			2048	1472	2144	1536	2272	1600	2656	2106
Cationic			2208	1760	2400	1952	3072	2272	2688	2048
Pyridine			2560	2208	2944	2144	2656	2400	2304	2144
Laundered										
Control	2182	1664								
Nonionic			3072	2336	3168	2560	2954	2112	3008	2112
Anionic			2208	1664	2144	1340	2336	1664	2208	1760
Cationic			2720	2080	3040	2368	3188	2529	3088	2496
Pyridine			2944	2460	2720	2464	2944	2176	2688	1664

[a] Federal Specification CCC-T-191b Test Method 5132.

TABLE VII
EFFECT OF SOFTENERS ON CREASE RECOVERY

Nominal softener concentration—Percent	0		0.5		1.0		2.0		4.0	
	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling
	Crease Recovery Angle—Degrees									
Monsanto Method[a]										
Unlaundered	114	121								
Nonionic			114	113	188	133	118	123	118	136
Anionic			112	116	126	133	112	110	110	129
Cationic			114	129	104	113	125	131	102	130
Pyridine			127	123	130	138	127	131	140	134
Laundered	129	139								
Nonionic			112	124	130	140	115	124	119	123
Anionic			112	125	124	139	112	129	117	137
Cationic			120	126	103	138	119	125	110	139
Pyridine			124	140	139	136	129	138	142	140
TBL Method[b]										
Unlaundered	2.8	3.0								
Nonionic			3.3	3.1	3.2	3.1	3.0	3.15	3.4	3.2
Anionic			3.1	3.2	3.3	3.2	3.3	3.2	2.9	3.0
Cationic			3.2	3.05	2.9	3.0	3.2	3.1	3.2	3.1
Pyridine			3.5	3.2	3.5	3.2	3.4	3.2	3.3	3.15
Laundered	3.4	3.25								
Nonionic			3.1	3.1	3.4	3.2	3.2	3.15	3.2	3.15
Anionic			3.2	3.2	3.3	3.2	3.2	3.2	3.25	3.1
Cationic			3.05	3.0	2.9	3.05	3.1	3.1	3.25	3.1
Pyridine			3.5	3.2	3.35	3.2	3.3	3.1	3.55	3.3

[a] AATCC Test Method 66-53.
[b] Rohm and Haas Bulletin "The Rhonite Resins"—pages 16-18 *(10)*.

TABLE VIII
FLAT ABRASION RESISTANCE TESTS

Nominal softener concentration—Percent	0	0.5	1.0	2.0	4.0
	Abrasion Resistance[a]—Cycles				
Unlaundered					
Control	564	—	—	—	—
Nonionic	—	363	373	338	389
Anionic	—	409	335	345	341
Cationic	—	340	348	370	323
Pyridine	—	397	370	365	316
Laundered					
Control	422	—	—	—	—
Nonionic	—	346	301	318	338
Anionic	—	338	398	414	349
Cationic	—	287	317	317	336
Pyridine	—	293	333	336	335

[a] Federal Specification CCC-T-191b Test Method 5302.

crease over the range investigated. Tear strength in the anionic-treated samples increased with increasing softener concentration over the entire range studied. Samples treated with this softener were also considerably different, after laundering, than the others, in that tear strength in the laundered state became practically independent of softener concentration.

Fabric samples treated with the nonionic, cationic, and pyridine softeners all showed increases in tear strength with increasing quantities of softener up to concentration in the range of 1 to 3 percent. Further increases in softener concentration reduced tear strength. Maxima in the curves were quite sharply defined in the nonionic softener treatments, and flatter for the cationic and pyridine types. Tear strength behavior was similar in the warp and filling direction, and laundering generally increased the tear resistance.

Since the anionic softener is not highly substantive, the disappearance of the concentration effect after laundering is not difficult to explain on the basis of more-or-less complete removal of the softener in laundering. That the nonionic product did not behave similarly is taken as an indication that it is more resistant to removal in laundering. This was also suggested by the results of the sewability tests.

Except for the anionic material, which produced much smaller tear strength increases than the others, the tear strength improvements were similar for all softeners.

F. CREASE RECOVERY———Crease recovery in the unlaundered state was improved by most treatments, although the only large increases were found in the pyridine softener treatments, as will be noted in Table VII. Laundering improved the crease recovery, and to a larger degree in the control than in the softener-treated specimens. In some instances, and particularly in the TBL tests, the control fabric showed better crease recovery after laundering than did the softener-treated samples.

The effects of softeners and laundering on crease recovery are apparently due to their actions on surface resin. Gruntfest and Gagliardi *(4)* demonstrated that the presence of a softener in a crease-proofing resin formulation promoted wrinkle recovery by maintaining multifilament character. This same effect probably accounts for the improvements brought about by softener applications after resin treatment, and by laundering. That these effects are not additive is indicated by the fact that, after laundering, smaller improvements in crease recovery were found in softener-treated samples than in the control.

G. FLAT ABRASION RESISTANCE ———As shown in Table VIII, the effects of all softeners, and laundering as well,

on flat abrasion resistance were quite similar. Except in the anionic-treated samples, flat abrasion resistance was reduced both by softeners and by laundering; as in crease recovery tests, the reduction due to laundering was largest in the control fabric and smaller in the softened materials. The 0.5 percent softener treatments in all cases produced the largest decrease in abrasion resistance, and concentration effects above 1 percent softener were small.

It is of interest to note that the anionic-treated samples, after laundering, showed higher abrasion resistance than before laundering. At the 0.5, 1, and 2 percent softener concentrations, abrasion resistance of the laundered samples is close to that of the laundered control. This is taken as further evidence that the anionic softener was largely removed in one laundering.

The loss in flat abrasion resistance on treatment with softeners was not duplicated in flex abrasion tests, as noted below.

H. FLEX ABRASION RESISTANCE ——The results given in Table IX show few substantial changes in abrasion resistance in unlaundered samples. Both reductions and gains were noted, but most of the changes are relatively small and no pronounced trends were found.

Laundering increased flex abrasion resistance generally, and the largest change found in this group was the substantial increase of the control sample following laundering. The treated samples generally showed smaller, but consistent, gains.

I. ROLL AND BREAK BEHAVIOR ——The roll and break test included in these studies has not been described in the literature. The possibility of using the Stoll instrument for this type of test has been noted *(12)*, but up to the present time roll and break testing has not been widely practiced. In the present work, the rolling was conducted with the instrument set up for flex testing, but with no flex bar employed. The fabric thus acted as a self abradant, and after 250 flexing cycles with a 1-pound pressure plate load, the samples were removed to a tensile testing machine and broken. Results are given in Table X.

The severe flexing of this test caused large reductions in tensile strength. For the tested fabrics, they ranged from 65 to 75 percent. After such large losses in tensile strength, it seems likely that essentially all of the fiber-to-fiber resin bonds are broken, and the resultant tensile behavior reflects the properties of a multifilament fabric, in which few, if any, surface resin bonds remain. If this is the case, differences in lubricity of the softeners might be expected to show up in this test.

All of the unlaundered softener-treated fabrics lost more strength in the roll-and-break test than did the control, and concentration effects were hardly detectable. The cationic and pyridine softeners, however, produced similar, and smaller, losses (approximately 70 percent after rolling) than did the nonionic and anionic products (approximately 75 percent in both cases).

Samples treated with the cationic and pyridine softeners showed essentially the same losses in strength after laundering as they did before laundering, while the losses in samples treated with the nonionic and anionic materials were reduced by the laundering process.

If it is assumed that the primary effect of softeners in this test is that of surface lubrication, the roll-and-break behavior after laundering can be partially explained on the basis of softener substantivity. Since both the cationic and pyridine softeners are relatively resistant to removal by laundering, their lubricant effects should not be greatly changed by the laundering process, and, as indicated by unchanged strength losses after laundering, this seems to be the case. The surface lubricity of the fibers treated with the nonionic and anionic materials, however, might be reduced by partial removal of these less substantive softeners in launder-

TABLE IX
FLEX ABRASION TESTS

Nominal softener concentration—Percent	Flex Abrasion[a]—Cycles: 0 Warp	0 Filling	0.5 Warp	0.5 Filling	1.0 Warp	1.0 Filling	2.0 Warp	2.0 Filling	4.0 Warp	4.0 Filling
Unlaundered										
Control	92	195								
Nonionic			93	203	108	198	75	176	136	234
Anionic			66	172	67	185	125	216	105	186
Cationic			91	181	99	191	122	210	112	166
Pyridine			91	199	96	219	93	241	80	215
Laundered										
Control	130	282								
Nonionic			98	208	105	243	103	232	103	269
Anionic			110	212	106	220	95	213	135	216
Cationic			128	251	108	227	126	247	144	233
Pyridine			105	242	93	234	106	246	92	277

[a] Federal Specification CCC-T-191b Test Method 5300, except that reported results are averages for two specimens.

TABLE X
EFFECT OF SOFTENERS ON ROLL-AND-BREAK STRENGTH PROPERTIES[a]

Nominal softener concentration—Percent		Unlaundered[b]: Strip tensile strength—lbs Initial	After Rolling	Percent loss	Laundered[b]: Strip tensile strength—lbs Initial	After Rolling	Percent loss
Control		110.8	38.2	65.5	108.6	32.8	69.8
Nonionic	0.5	108.6	27.4	74.8	104.6	32.4	69.0
	1.0	109.4	26.2	76.1	105.6	35.0	66.9
	2.0	110.8	25.6	76.9	108.8	34.8	68.0
	4.0	108.4	34.4	68.3	106.6	34.6	67.5
	Average	109.4	28.4	74.0	106.4	34.2	67.8
Anionic	0.5	111.0	25.8	76.8	107.8	27.0	75.0
	1.0	105.6	26.2	75.2	112.0	28.8	74.3
	2.0	105.4	25.6	75.7	106.8	34.0	68.2
	4.0	109.2	28.2	74.2	107.8	33.6	68.8
	Average	107.8	26.4	75.5	108.6	30.9	71.6
Cationic	0.5	112.6	32.8	70.9	115.2	36.0	68.7
	1.0	109.8	33.0	69.9	107.6	31.4	70.8
	2.0	111.4	34.0	70.4	107.6	30.2	71.9
	4.0	110.2	31.8	71.1	112.4	33.0	70.6
	Average	111.0	32.9	70.6	110.7	32.7	70.5
Pyridine	0.5	109.6	36.0	67.2	104.8	31.2	70.2
	1.0	107.8	30.8	71.4	107.6	33.6	68.8
	2.0	106.8	32.4	69.7	107.2	39.0	63.6
	4.0	104.8	32.0	69.5	106.0	23.8	77.5
	Average	107.2	32.6	69.5	106.4	31.9	70.0

[a] Samples were mounted in the Stoll Universal Wear Tester as for flex abrasion resistance measurements, and were rolled for 250 cycles with a pressure plate load of 1 pound. No flex bar is employed in this test; the fabric rolls freely between the head plate and the reciprocating table.
[b] All tests were performed in the warp direction.

TABLE XI

EFFECT OF SOFTENERS ON COEFFICIENT OF FRICTION

Nominal softener concentration—Percent	Average coefficient of friction for warp and filling directions 0	0.5	1.0	2.0	4.0
Unlaundered					
Control	0.158	—	—	—	—
Nonionic	—	0.123	0.123	0.125	0.132
Anionic	—	0.132	0.127	0.127	0.125
Cationic	—	0.132	0.118	0.127	0.141
Pyridine	—	0.132	0.132	0.118	0.103
Laundered					
Control	0.149	—	—	—	—
Nonionic	—	0.123	0.123	0.116	0.121
Anionic	—	0.123	0.123	0.123	0.123
Cationic	—	0.123	0.114	0.141	0.144
Pyridine	—	0.132	0.127	0.114	0.103

ing; such a reduction in lubricity would probably lead to a reduction in tensile strength loss in the laundered samples. This also fits the results, since both the nonionic and anionic-treated samples showed reduced losses after laundering. There is rather strong evidence from the tear and sewability tests that the anionic softener is most readily removed in laundering, however, and this does agree with the surface lubrication theory as applied to the roll and break test, where the lowest loss, after laundering, is found in the nonionic-treated samples.

J. COEFFICIENT OF FRICTION ———Although surface friction is not commonly measured in textile materials, and is probably not the most important of the several qualities which, in aggregate, constitute fabric hand, this property is undoubtedly important. Because of its relation to hand, and because equipment for its quantitative estimation was available, the metal-to-fabric coefficients of friction of the various samples were determined. Results are given in Table XI.

Variations in coefficient of friction vary over a relatively narrow range—the minimum angle at which the test weight would just slide down the inclined, fabric-covered, plane was 6 degrees, and the maximum 9 degrees.

Laundering reduced the coefficient of friction slightly at the higher concentration of nonionic and anionic softeners. The following additional observations were made for the individual softeners tested.

1) A minimum coefficient, in both laundered and unlaundered states, was found at the 1 percent concentration of cationic softener, with a very small laundering effect.
2) Coefficient of friction shows a progressive reduction at increasing concentrations of the pyridine softener, with no apparent laundering effect.
3) After laundering, the coefficients of friction in the nonionic and anionic-treated samples are practically independent of concentration.

The observations relative to laundering effects appear to correlate positively with softener "substantivity". The cationic and pyridine types are believed to be more resistant to removal in laundering than the nonionic and anionic softeners, and the friction coefficients of the former pair were practically unchanged by laundering, while the latter pair both showed changes.

K. TENSILE STRENGTH———Tensile testing was not part of the original testing program, but strip tensile measurements were made as part of the roll-and-break tests. The results, given in Table X, show no effects of softener type or concentration. There was practically no change in tensile strength after laundering. Previous research by the Piedmont Section *(9)* has also shown that the effect of softeners on fabric tensile strength is not large.

IV SUMMARY

Softeners of different chemical type have been found to product important differences in the following physical properties of treated fabrics:

a) Hand
b) Stiffness
c) Sewability
d) Tear strength
e) Wrinkle resistance
f) Roll and break characteristics
g) Coefficient of friction

Under the experimental conditions, all of the softeners investigated produced essentially the same changes in the following physical characteristics:

a) Laundering shrinkage (unchanged by any softener)
b) Flat abrasion resistance
c) Flex abrasion resistance
d) Tensile strength (unchanged by any softener)

Effects of the different softeners on fabric properties may be summarized as follows:

Hand

Only the cationic and pyridine softeners produced major changes in fabric hand. The effect of the cationic material was not detectable before laundering, while the effect of pyridine softener was less noticeable after laundering than before it.

Stiffness

Among the unlaundered specimens, only those which had been treated with 2 and 4 percent of the pyridine softener showed substantial reductions in stiffness. The anionic material, at all concentrations, increased stiffness slightly. The stiffness in both softened and unsoftened fabrics was generally reduced by laundering.

Sewability

All of the softeners improved sewability of the unlaundered samples; the cationic and pyridine types were the most effective. A further improvement in sewability was produced by laundering. The anionic softener was least efficient in improving sewability.

Tear Strength

The tearing strength of all samples was increased by softener application, and by laundering.

Crease Resistance

Only the pyridine softener produced a marked increase in wrinkle resistance before laundering. The laundering process improved wrinkle resistance slightly in all fabrics, including the control, but the effect of the other softeners on wrinkle resistance was not large.

Flat (Inflated Diaphragm) Abrasion Resistance

All of the softeners studied reduced flat abrasison resistance, as did laundering.

Flex Abrasion Resistance

Changes in flex abrasion resistance, both before and after laundering, varied considerably with softener type. Both gains and losses were found, but the largest increase, of the order 40 percent in both warp and filling directions, was found in the control sample after laundering.

Roll and Break Behavior

When subjected to flexing without abrasion and subsequently tested in tension, the unlaundered softener-treated samples showed greater strength losses than the unsoftened control. These losses were reduced by laundering in the case

of the nonionic and anionic softeners, but remained practically constant for the cationic and pyridine type softeners.

Coefficient of Friction

All of the softeners reduced the metal-to-fabric coefficient of friction. Laundering did not affect this property.

Tensile Strength

Tensile strength was not significantly influenced by any of the softening treatments, nor by laundering.

Shrinkage

Pick and end counts on samples taken before and after laundering show no significant differences in shrinkage among the various treatments. All of the samples tested were found to be well stabilized.

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VI ACKNOWLEDGMENTS

The assistance of the following organizations in contributing laboratory facilities, services of personnel, materials, and technical information is acknowledged with thanks and appreciation. Special thanks are due the Riegel Development Laboratories for the contribution of the fabric used in these studies.

Abbeville Mills Corp
American Viscose Corp
Burlington Mills
Clemson College School of Textiles
Cone Mills Corp
Dan River Mills
E I du Pont de Nemours and Co, Inc
North Carolina Finishing Co
North Carolina State College School of Textiles
Riegel Development Laboratories
Rohm and Haas Co
United States Rubber Co

APPENDIX (Test Methods)

Stiffness—Saxl Method *(10)*

A 3" x 6" sample is taken from the center of the fabric with the longer dimension parallel to the warp.

One end of the sample is held in a clamp on a protractor, while the free end of the sample rests on a balance arm. The weight of the cloth resting on the balance arm is compensated for by adjusting weights on the opposite end of the balance arm to equal the cloth weight, and bring the balance to equilibrium.

A definite weight is then added to the balance arm (in these tests, 0.5 and 0.25-g were used). The protractor is then moved to cause the cloth to press down and bring the balance arm in equilibrium again.

A measurement is taken, reading the number of degrees to which the protractor has been moved in order for the cloth to balance the known weight. The stiffer the cloth, the smaller the angle required, and the softer the cloth, the greater the angle required, and the higher the reading obtained. The figures reported are an average of 2 determinations on the same sample, one reading on the face and one on the back of the cloth.

The Saxl stiffness figures are angle degrees, and represent the deflection of the protractor from a 90° angle, when the weight of the cloth is first balanced, to the angle read at the end point when the cloth balances a known weight. (For example, in the first figure in Table IV, the water blank sample had to be bent from 90° to 156° to balance a 0.5-g weight.)

Sewability—Cluett, Peabody Needle-cutting Test

PURPOSE———This test was devised to determine the susceptibility of fabric to needle cutting during manufacturing processes.

GENERAL PROCEDURE———A seam is sewn into the sample. The stitching is removed and yarns parallel to the seam are ravelled out. An actual count of broken vs unbroken ends is then made.

DETAILED PROCEDURE———

a. *Sample Preparation*
   1. Cut one sample 8" x 14", with the long direction parallel to the warp.

b. *Equipment*

   Singer Sewing Machine Model 231-4 equipped with:
   1. Folder for Seam Type 401, LSC-2, ⅛" gauge
   2. 14 stitches per inch
      Thread Size: HHT #100
      Needle Size: 149 x 1, Size 16 Singer Needle

c. *Test Procedure*
   1. Cut the sample in half in the warp direction.
   2. Sew the two halves of the sample back together again using the folder on the felling machine to form a felling seam.
   3. Carefully ravel the stitching of the seam taking care not to break the yarns in the fabric.
   4. Cut a 2" strip from the ravelled seam.
   5. Count the cut yarns in the 2" strip in the second row of stitching in the bottom layer of fabric. The second row of stitching is the one made by the right hand needle.

RESULTS———Divide the number of cut yarns by the total number of yarns in the 2" strip; multiply result by 100 to obtain needle cutting in percent. Filling results, obtained on the sample stitched along the warp, are reported in Table XI.

Roll and Break Test

The roll and break test is designed to measure resistance to flexing and self-abrasion. So far as is known, no standard specifications for this test have yet been adopted. The roll and break test reported in this paper were conducted as described below:

Strips of fabric 12" long and approximately 1" in width were prepared, as for strip tensile testing. The control sample was 1" wide, and others included the same number of ends. Each strip was then mounted in the Stoll Universal Wear Tester, set up for flex testing, but without the flex bar, and the fabric was rolled for 250 cycles with a pressure plate load of one pound. Following flexing, samples were removed from the machine and tensile tested in accordance with Federal Specification CCC-T-191b Test Method 5104. Two breaks, each including the same warp yarns, were made in each sample, one in the flexed area and the other outside it. Test results appear in Table IX.

Coefficient of Friction

METHOD OF MEASUREMENT———Coefficient of friction is defined as the tangent of the angle of incline necessary to overcome the force of friction between the fabric and a metal surface, and the test method involves measurement of the angle at which a metal block will just slide down a plane surface covered with the test fabric.

DESCRIPTION OF APPARATUS———The apparatus consists of an in-

clined plane with an adjustable angle. A pointer on the inclined side indicates the angle on a scale attached to the base.

The sample is attached to the inclined side, which is covered by a piece of plate glass.

For metal-to-fabric tests, a metal block 1" x 3" x 3/16" is used. It weighs 80 grams, and has a polished non-tarnishable surface which is placed next to the fabric sample.

SAMPLE PREPARATION———
Number of specimens—2 warp, 2 filling
Size of specimens—4" x 6"
Conditioning—4 hours at 70°F, 65 percent R H

PROCEDURE———Attach the sample to the plate glass with pressure-sensitive tape.

Place the block on the sample, with the long direction parallel to the length of the incline in the case of fabric-to-metal tests.

Slowly raise the incline until the block moves slowly along the entire length of the sample.

Read from the scale the angle of the incline, to the nearest 15 minutes. Take two readings on each sample with the metal block, one down each side.

CALCULATIONS ——— Record the angles. Average results for each specimen.

From a table of functions, find the tangent for the average angle. Average the tangents for each specimen of fabric. The coefficients are reported as the tangent of the average angle for warp and filling directions.

Annual Meeting of the Inter-Society Color Council

THE 24th Annual Meeting of the Inter-Society Color Council will be held in the Skytop Room at the Statler Hotel, New York, N Y, on Wednesday, April 6, 1955. The morning session will be occupied by reports of the subcommittees of the Problems Committee and the annual business meeting, which will include reports of the officers and chairmen of the delegations from the member bodies. The afternoon and evening sessions are being planned by a committee of the Illuminating Engineering Society. During the afternoon four presentations are being arranged as follows: "How You See Colors" by Robert W Burnham, research psychologist—Eastman Kodak Company; "Control of Moods and Atmosphere" by Richard Kelly, lighting designer and consultant architect; "Color Timing in Merchandising" by Helen D Taylor, director of the Color Bureau, Tanners' Council of America; and "Color at Work" by Edward Carswell, School of Architecture, University of Toronto.

In the evening a banquet will be held in the Skytop Room at the Statler and the speaker, Ralph M Evans, will give his lecture "Creative Directions in Color Photography." Further details on this meeting may be obtained by writing to Mr Evans, secretary of the Inter-Society Color Council, Color Technology Division, Building 65, Eastman Kodak Company, Rochester 4, New York.

ADDENDUM

In addition to those listed on page P48 of our January 17, 1955 issue, the following members of the Philadelphia Section devoted their time and effort to produce the Section's 1954 Intersectional Contest paper: Carleton T Anderson, Ciba Co, Inc; Frank J Britz, National Aniline Div; Alfred W Cowan and Edward C Diehl, Ankokas Dyeing & Processing Co; Ralph J Ellis, E I du Pont de Nemours & Co, Inc.

Frederick V Traut (right), Globe Dye Works Co, chairman of the Philadelphia Section, greets Bertrand W Hayward, president of Philadelphia Textile Institute, at the opening session of a series of eight classes on "Theories of Dyeing." Looking on is Richard B Stehle, Brehm and Stehle Co, who presented a general survey of dyeing processes to inaugurate the series.

The course, being given at PTI in cooperation with the Philadelphia Section, will run through March 28th. Forty members of AATCC are enrolled in the course, which has been planned by Thomas Hart, Hart Products Corp, vice chairman of the Section.

EMPLOYMENT REGISTER

This column is open for two insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Post Office Box 28, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the Secretary.

55-1

Education: B S, textile engg.

Experience: finishing supervisor & salesman.

Age: 27; single; veteran; references; sales service position desired, location immaterial.

2-14, 2-28

55-2

Education: M A, chemistry, with additional year in statistics.

Experience: chemist, textiles & detergents.

Age: 42; single; veteran; references; position as chemist in production or applications research desired, northeastern or midwestern U S preferred.

2-14, 2-28

55-3

Education: B S, chemistry & dyeing.

Experience: dyer & chemist.

Age: 35; single; veteran; references; position as dyer or textile chemist desired, New England or elsewhere in northern U S preferred.

2-14, 2-28

55-4

Education: high school, with college courses in time study methods.

Experience: supervisor of textile finishing plant installation and operation, 28 years with one company now moved from area.

Age: 56; married; references; position supervising finishing operation up to dyeing desired, northeastern U S preferred but not essential.

2-14, 2-28

55-5

Education: S M, textile technology; S B, business & engr administration.

Experience: 1st Lt, U S Army, chief test officer, QM Corps test team; textile technologist; production expeditor.

Age: 25; married; available about April 1; position as executive asst or project engr desired; N Y area preferred but not essential.

2-28, 3-14

55-6

Education: B S, textile chemistry, with additional courses in textile testing.

Experience: chief chemist & dyer, wool & synthetics.

Age: 50; married; references; New England preferred but not essential.

2-28, 3-14

MEMBERSHIP APPLICATIONS

(Letters in parentheses indicate Section to which applicant will be assigned)

January 18, 1955

SENIOR

Vivian Avery—Boss dyer, Central N H Dye, Inc, Laconia, N H. Sponsors: S H Wilson, C B Coan.

Silas M Gates—Supt printing, Consolidated Textile, Inc, Taunton, Mass. Sponsors: J Falcon, C F Stokes.

Rudolf H Griesser—Works mgr, Dyeing & Finishing Plant, Bradford Cotton Mills Ltd, Sydney, Australia.

Lloyd H Perry — Tech director, Union Bay State Chemical Co, Cambridge, Mass. Sponsors: E R Kaswell, K R Fox.

JUNIOR

William Tannenbaum — Chemist, Brook Chemical Co, Clifton, N J. Sponsors: S Schwartzman, T H Boss.

Robert C Wagman—Res, devel, testing, administrative, Moss Rose Mfg Co, Sponsors: F V Traut, A E Stutzke.

STUDENT

Albert T Taylor, Jr—Georgia Institute of Technology. Sponsor: W Postman.

APPLICATION FOR TRANSFER TO SENIOR MEMBERSHIP

Edward G Mercer
Gennaro V Raso

January 28, 1955

SENIOR

Joseph L Borstelmann—Textile Resin Development, American Cyanamid Co, Bound Brook, N J (NY). Sponsors: W N Nakajima, R D Vartanian.

Robert C Cottrell—Tech service engineer, Dow Chemical Co, Midland, Mich. (MW). Sponsors: P A Gruber, E D Serdynsky.

John Czimcharo—Colorist, Church Street Print & Finishing Co, New York, N Y (NY) Sponsors: S Kendee, R H Bresnan.

Rune K Edman—Chemist, Svenska Yllekoncernen, Boras, Sweden.

Rudolf H Griesser—Works mgr, Bradford Cotton Mills Ltd, Sydney, Australia.

Joyce A Hutchinson—Research assistant, Canadian Res Inst of Launderers & Cleaners. Sponsors: C H Bayley, L J Sheps.

Ernest S Kandibo—Supervisor, Royal Knitgoods Dyeing Co, Inc, Brooklyn, N Y. (NY). Sponsors: G H Alpers, E C Jakob.

William C Parker—Colorist, Cranston Print Works Co, Fletcher, N C. (PIED). Sponsors: T J Latham, C J Barriere.

Stuart L Sperber—Tech sales & service, Warwick Chem Co Div, Sun Chemical Corp, Wood River, R I. (RI). Sponsors: S H W Nye, A N Henschel.

Henry F Stevenson—Dyehouse tech, Stevenson & Sons Ltd, Moygashel Mills, Dungannon, N Ireland. Sponsors: J K Skelly, A Howarth.

Robert Welsh, Jr—Sales rep, James Hunter Machine Co, North Adams, Mass. (PHIL). Sponsors: H F Creegan, D G Spink.

John T Wigington, Jr—Bleachery foreman, Chicopee Mfg Corp, Chicopee, Ga. (SE). Sponsors: A K Haynes, J F Wigington.

JUNIOR

James C Childress—Dyer, Kingsboro Silk Mills, Daisy, Tenn. (SCL). Sponsors: W G Quick, T J Marler.

Richard A Gifford—Dye Standardization Lab, Arnold Hoffman & Co, Inc, Dighton, Mass. (RI). Sponsors: A MacGregor, M R Fox.

ASSOCIATE

Cima D Balser—Vice-pres, National Dyeing & Fin Corp, Culver City, Calif. (PSW).

Virginia M Hagenlocher—Vice-pres, National Dyeing & Fin Corp, Culver City, Calif. (PSW).

Gilbert M Hopkins—Sales engineer, Rodney Hunt Machine Co, Merchantville, N J. (PHIL).

En T Ming—Research chem engineer, National Aluminate Corp, Chicago, Ill. (MW).

Harvey D Shapley—Production mgr, Boris Kroll Fabrics, New York, N Y. (NY).

STUDENT

Victor C Braun, Jr—Philadelphia Textile Institute—Sponsor: W H Hughes.

APPLICATION FOR TRANSFER TO SENIOR MEMBERSHIP

Thomas J Reilly
Achille C Scache

February 11, 1955

SENIOR

Marvin C Alexander—Dyer, Cherokee Textile Mills, Knoxville, Tenn. (SCL). Sponsors: H A Walker, M S Morrison, Jr.

Lloyd E Bass—Textile printing colorist, Werthan Bag Corp, Nashville, Tenn. (SCL). Sponsors: W S Pearson, S G Stribling III.

Daniel E Boland — Engineer, Lockport Mills Inc, Lockport, N Y (NF) Sponsors: T R Foltz, Jr, B K Easton.

Howard L Cardwell — Dyer, Cherokee Textile Mills, Knoxville, Tenn. (SCL) Sponsors: H A Walker, M S Morrison, Jr.

August Chwala—Textile chemist, Ziegelgasse, Austria.

David M Davidson—Division chemist, The Visking Corp, Fabrics Div, North Little Rock, Ark. (SCL). Sponsors: H L Leventhal, H A Dickert.

Raymond C Gagnon — Acting director, School of Textiles, International Correspondence Schools, Scranton, Pa. (PHIL). Sponsors: J P Ploubides, R M Lesh.

Roger A Herndon—General overseer of dyeing, Virginia Mills, Swepsonville, N C. (PIED). Sponsors: R E Taylor, C M Spoon.

William R Leverenz—Foreman, Portland Woolen Mills, Portland, Ore. (PNW). Sponsors: A H McKenzie, R C Pickens.

Joseph A Piepmeyer—Research chemist, Emery Industries, Inc, Cincinnati, O. (MW). M H Smith, Jr, H T Buckley.

Bernard L Reers—Owner & dyer, Charleston, S C. (PIED). Sponsors: W L Barker, H L Shinn.

Ernest B Schultz—Dyer, Barton Rough Hat Co, Bethel, Conn. (WNE). Sponsors: T J Gillick, Jr, W Ferrazano.

Harry Shenker — Chemist, Washine-National-Sands, Inc, Long Island City, N Y. (NY). Sponsors: G Fox, M M Schlier.

Thomas M Swoyer—Assistant dyer, Ladd Knitting Mills, Reading, Pa. (PHIL). Sponsors: R Kobb, S Scheibner.

Estelle M Tennis — Exec secy, Textile Color Card Assn of U S, New York, N Y. (NY). Sponsors: J F Warner, J R Bonnar.

Arno M Timmerman—Assistant dyer, Portland Woolen Mills, Inc, Portland, Ore. (PNW). Sponsors: A H McKenzie R C Pickens.

Clyde F Wagner—Plant engineer, Portland Woolen Mills, Portland, Ore. (PNW). Sponsors: R C Pickens, D E Adams.

JUNIOR

G Lewis Morgan — Dev chemist, Azo Dyes & Intermediates, Organic Chem Div, American Cyanamid Co, Bound Brook, N J. (NY). Sponsors: M L Kesler, N M Mackenzie.

Pierluigi Verga—Lab tech, Arnold Hoffman & Co, Inc, Providence, R I. (RI). Sponsors: T H Roberts, A C Merrill, Jr.

ASSOCIATE

James G Hecker, Jr — Dev engineer, Aluminum Co of America, New Kensington, Pa. (PHIL).

STUDENT

Heran Schreiber — Philadelphia Textile Institute. Sponsor: W H Hughes.

APPLICATIONS FOR TRANSFER TO SENIOR MEMBERSHIP

Robert H Carlson
Walter C Comer, Jr
Joseph L Foy
George A Heath
Kurt Moses
Raymond L Ward

NOTICE TO AUTHORS OF PAPERS

MANUSCRIPTS for the *Proceedings* and for other publications of the American Association of Textile Chemists and Colorists shall conform to the requirements and standards given in this *Notice*. Before publication, manuscripts for the *Proceedings* shall be approved by the Editor, not only for editorial correctness according to the standards of this *Notice*, but also for content of technical matter. In his work, the Editor may enlist the aid of anonymous reviewers who are selected for expert knowledge in particular fields.

It is presumed that authors in studying the comments of reviewers and of the Editor will remember that all recommendations are made in a kindly, helpful, sympathetic manner to improve the paper in both literary and technical excellence. Although authors should cheerfully consider suggestions, they are expected to defend their position if justified, especially when strictly technical matters are involved with which the authors have an intimate knowledge.

MANUSCRIPTS—Manuscripts shall be typewritten double-spaced with approximately one-inch margins on 8.5 x 11-inch white paper. In addition to the *original*, at least one carbon copy is required. Pages are to be numbered consecutively with Arabic numerals, and each page after the first shall carry the authorship at the very top. Tables and figures shall also be numbered consecutively, the tables with headings containing Roman numerals as TABLE I, TABLE II, etc, and the figures with Arabic numerals as Figure 1, Figure 2, etc, appearing *below* the figures. The names of the authors and their laboratories or business connections should appear below the title of the paper.

ARTICLES APPEARING IN THE "PROCEEDINGS" IN RECENT ISSUES OF THE "AMERICAN DYESTUFF REPORTER" will be helpful to authors as models of form for the typing of manuscripts.

LITERARY STYLE AND FORM OF PRESENTATION—In the writing of papers, authors are requested to observe a trenchant, simple style of writing directed to textile chemists and colorists with at least an elementary knowledge of chemistry, physics, mathematics, engineering, textile processes and textile machinery.

In the organization of the material, there should be one or more introductory paragraphs setting forth the occasion, significance and main objectives of the paper and of the method of attack. This should be followed by the body of the presentation, either with discussions interspersed throughout this portion or with a collected section marked "DISCUSSION" after the main body of the paper. Finally, there may be a brief section at the end entitled "SUMMARY" of "CONCLUSIONS."

Center and side headings make for easier reading. Center headings should be employed sparingly and generally will include only very important section headings, such as "INTRODUCTION," "EXPERIMENTAL," "DISCUSSION," "CONCLUSIONS," "SUMMARY," and "REFERENCES." Side headings (see third paragraph of this *Notice* for an example) shall be indented and run into the text to which they apply, and shall be separated from the paragrpah by a dash. The publisher will print center headings in bold-face capitals and side headings in capitals.

LITERATURE REFERENCES AND FOOTNOTES—References to the literature and all footnotes (except those in tables) shall be numbered consecutively with underlined Arabic numerals in parentheses at the proper place in the text. Where a reference or footnote is to be used again, the original number is simply repeated; this obviates the necessity of repeating the footnote or reference at the bottom of the page. References to the literature shall conform to the universal usages followed by *Chemical Abstracts*, which include underlining of book and journal names to indicate italicization in printing.

The spelling and rules of punctuation followed in manuscripts shall be those found in the *Merriam-Webster New International Dictionary*; abbreviations and chemical formulas shall conform to *Chemical Abstracts*. Periods shall be used only at the end of sentences, not after abbreviations.

FIGURES AND GRAPHS—Figures and graphs should be black line drawings on white drawing paper. Photographic prints are acceptable, preferably glossy prints on double-weight paper. Duplicates should be available for dispatch to reviewers. Diagrams and graphs should preferably be designed in long form to cover one column of print but may be two columns wide or the width of a full page where necessary. In graphs the frame and actual curves should be inked more heavily than the co-ordinate lines, and these latter should not be too close together. Various styles of broken lines are sometimes desirable to distinguish curves. Experimental points should be given with small plane figures, such as circles, squares, diamonds or triangles. Numbers and legends on co-ordinate axes are to be lettered in the graph by the author. Numbers and titles of figures should be placed below the diagram or on the edge of the back. Each piece of illustration copy should bear on the margin or on the edge of the back the name of the author and the title of the paper.

Photographs of authors should be included with copy, to be run in conjunction with the paper. These must be on glossy stock, and should be large enough for proper reproduction.

TABLES—Tables should not be used indiscriminately because they are very expensive to set up in type. They should be designed to be one column, two columns or three columns wide. Tables should be arranged with the view of conserving space; column headings should be short and abbreviated. Quantity designations shall never appear in the body of the table but in the headings. Tables, if possible, should be placed in the manuscript where they belong rather than separately.

SYNOPSIS—A separately written synopsis of not over 200 words containing the gist of the subject matter must accompany every manuscript.

GALLEY PROOFS—Galley proofs will be sent to the author by the publisher for correction before publication. This should not be interpreted as an invitation to rewrite the paper but rather as an opportunity to correct errors.

REPRINTS—Fifty reprints of papers published in the *Proceedings* will be furnished without charge by the publisher if requested when galley proofs are returned. These reprints are printed on one side of the sheet only and then stapled together. A schedule of prices of reprints in the usual form accompanies the galley proofs.

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TRADE-MARKS — As the AATCC wishes to co-operate in the protection of trade-marks, it is requested that, in the body of the article, trade-mark names be written with an initial capital letter. Courtesy demands that authors include competitive products as well as those of his firm. Many current trade-mark names are to be found in the *AATCC Technical Manual and Yearbook*.

• PATENT DIGEST •

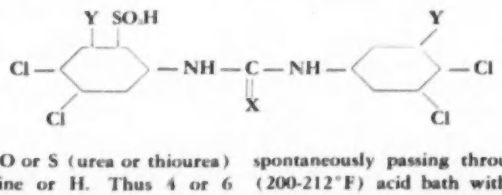
PAUL WENGRAF

NYLON DYEING RESIST——— Aromatic Chlorosubstituted Monosulfonic Acids of Urea C,4,07

Brit Pat 709,977 (J R Geigy——June 2, 1954)

Difficulties have been experienced in dyeing wool-nylon mixed yarns with acid dyes because these dyes show different affinities for both fibers. It was formerly proposed that specific agents, such as organic sulfonic or carboxylic acids, be added to the dyebath to reduce the point of saturation of the polyamide fibers, even to inhibit completely the uptake of the dyes. For the most part, however, agents which completely reserve the polyamide portion of the fabric are very strong, thereby influencing also the properties of the wool yarns. A separate pretreatment of the synthetic yarns with one of the resisting agents before twisting, weaving or otherwise combining with wool yarns might obviously be too expensive.

According to the current invention, mixed wool-polyamide fabrics can be dyed without damaging the wool portion while leaving the nylon portion practically uncolored by pretreating with a solution of a monosulfonated and polychlorinated diphenyl urea or diphenyl thiourea of the general formula:



wherein "X" is O or S (urea or thiourea) and "Y" chlorine or H. Thus 4 or 6 chlorine atoms may be present in the molecule. These agents are said to be very selective; they might even be added to the bath during the dyeing process, without any pretreatment.

Example: a wool-nylon mixture (10% nylon) is dyed initially in the presence of the tetrachloro diphenyl urea monosulfonate of sodium, Glauber's salt and some acetic acid with a red acid-azo dyestuff at 40°C. The bath temperature is then raised to the boil within 30 minutes and boiling continues for 45 minutes, after which formic acid is added and boiling continues for another 15 minutes. The wool portion is dyed red while the nylon portion remains white.

The hexachloro compounds were found to be better resisting agents than the tetrachloro substitutes; thiourea compounds are more efficient resists than the corresponding urea compounds of equal chlorine content in the molecule.

This patent may cover the production of "Nylon Resist MFF", described in the *1954 Technical Manual and Year Book of the AATCC* (page 340) as a "sulfonated aromatic urea condensate".

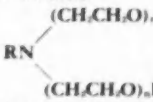
CONTINUOUS DYEING ACID LEUCOVATS ON ANIMAL FIBERS Developed in Boiling Acid C,4,02

U S Pat 2,681,841 (General Dyestuff——Luttringhaus——June 22, 1954)

Several processes for vat dyeing alkali-sensitive textiles, such as wool or cellulose acetate, by applying acid vats, leuco vat dispersions or dispersed nonreduced vats from acid media have been described. U S Patents 1,900,172; 2,107,526 and 2,450,767 (see references below) are quoted in this specification. The inventor states that these methods involve time-consuming operations for fixing or applying the dyes; they are therefore unsuitable for continuous dyeing.

A process for dyeing animal fibers rapidly and continuously in very fast shades, as protected by the current patent, comprises padding the goods with leuco vat dyes in aqueous dispersion and developing without intermediate drying by spontaneously passing through a boiling (200-212°F) acid bath within about one minute, then reoxidizing. The padding liquor is prepared by first adding an acid-stable dispersant (alkyl-aryl sulfonate, Igepon T, etc) to the alkaline vat and acidifying to a pH of 3-6, preferably with formic or acetic acids.

Penetration and fixation of the acid vat is further promoted by adding as a "booster" compound certain ethylene oxide condensates of higher amines of the general formula



wherein R is an aliphatic chain of 10-18 C, and m and n are at least 2, but generally higher ethylene oxide condensates (up to 20 ethylene oxide groups) are employed.

The claims especially protect dyeing methods with vat dyes of the indigoid or bis-arylido benzoquinone series.

Example: 10 p of the alkaline vat of the thioindigoid vat dyed C I #1207 (Helindon Red BBD, Calcosol Pink 2BP, etc) are mixed with 20 p of a formaldehyde naphthalene sulfonate (Tamol) and acidified with a solution of 18-20 p acetic acid 28% in 100 p water to form a stable dispersion. A woolen fabric is padded in this bath, squeezed to a pick-up of 100% and immediately passed through boiling formic acid 2%. The immersion time is about one minute. On exposure to air a bluish-red shade of excellent fastness to light and air reportedly is obtained. Another example calls for the addition of a condensate of one mol laurylamine or the like to 8-10 mols ethylene oxide plus the aforementioned formaldehyde naphthalene sulfonate to the vat dye C I # 1176, ie, Helindon Brown CM (diarylido chloroquinone).

References cited by the Patent Office:

U S Pat 2,552,404 (Ciba/1951): dyeing wool with dyestuffs having affinity for the fibers under acid conditions (acids and Indigosols) by padding with the dye solution and suddenly immersing in boiling sulfuric acid 3% [cf *Am Dyestuff Reptr 40*, 715 (1951)].

U S Pat 2,450,767 (Allied Chemical & Dye/1948): dyeing woolen goods by first impregnating with a suspension of the nonreduced vat dye pigment and subsequently adding a reducing agent (zinc sulfoxylateformaldhyde) under strongly acidic conditions [cf *Am Dyestuff Reptr 38*, 111 (1949)].

U S Pat 2,107,526 (Dreyfus/1938): padding cellulose acetate fabrics with leucovats; drying is performed mainly in inert atmosphere (N or CO_2), and followed by reoxidation.

U S Pat 1,900,172 and Brit 355,363 (Celanese/1933): dyeing cellulose acetate with free leuco vats obtained by slightly acidifying the standard vats and reoxidizing.

Kraehenbuehl and Casty in *J Soc Dyers Colourists* of August, 1949 (pages 381-6) explain the method of continuously dyeing wool by impregnating the goods with acid, chrome or Indigosol dyes, and following with immersion in boiling dilute acid. Thus the Ciba-Casty method (cf reference to U S Pat 2,552,404 above) refers principally to acid and Indigosol dyes that are substantive to animal fibers under acid conditions, while the current process involves a padding process with acid leuco dyes having no substantial affinity to these fibers.

• Globe Dye Works Celebrating 90th Anniversary

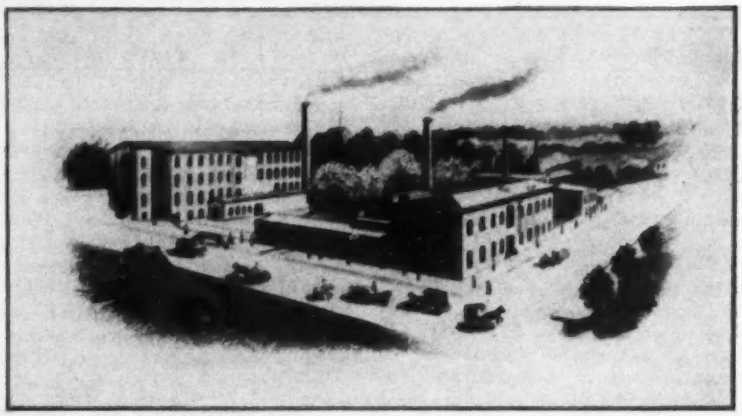
The Globe Dye Works Company, founded in 1865 by Richard Greenwood and William Bault, points with pride to their slogan, "You Can Rely on Globe," as the firm this year celebrates its 90th year.

Still located on the site of the original plant in the Frankford section of Philadelphia, the vast, modern Globe establishment today occupies over 100,000 sq ft of space, and is recognized as one of the country's largest yarn dyeing plants.

Heading the Globe organization are Horace T Greenwood, president, and Paul Greenwood, vice president and treasurer, grandsons of one of the founders. Also active in Globe's management are the two sons of the fourth generation of Greenwoods on Globe's executive staff.

Originally known as dyers and bleachers of cotton yarns, Globe has expanded its services to encompass package dyeing on tubes, skein and warp dyeing and bleaching, warp mercerizing and sizing. Yarns processed include cotton, rayon, worsted, linen, blend and novelty yarns, nylon, and the new synthetics, such as Orlon, Dacron, Acrilan, etc.

The Globe plant, equipped with the most modern equipment for all types of dyeing, includes the latest high-temperature-dyeing units for the various synthetics, plus special types for handling resist-dyed acetate filament yarn for suitings.



Original plant of Greenwood & Bault (site now occupied by Globe Dye Works Co)

Aerial view of Globe Dye Works plant (Philadelphia, Pa)

• Butterworth Enters Into New Agreement

Arrangements for the sale and servicing of textile finishing machinery made in Germany by A Monforts, Maschinenfabrik, have been announced by H W Butterworth & Sons Company, Bethayres, Pa, machinery builders and Texplant Corp, Stamford, Conn, machinery importers.

Machinery covered by the agreement includes nappers, air drying equipment and cloth room machinery. Air drying machinery made by Monforts includes curing ovens, tensionless dryers and printing dryers. Monforts makes gray room machinery for cropping, brushing and spraying, and finishing machinery for rolling, folding, doubling and hooking.

J Ebert Butterworth, president of H W Butterworth & Sons Company, points out that his firm has been associated with Texplant in a joint venture agreement since 1951. Albert J Lindell, Texplant president, has been a foreign sales representative for Butterworth since 1944.

The Monforts line of machinery supplements Butterworth's diversified equipment for the wet end of textile finishing, according to Mr Butterworth. Spare parts and service will be a Butterworth responsibility. Texplant will join with Butterworth in sales and financial arrangements.

• UAC Opens New Facilities

United Aniline Company, which has been located for the past 35 years at 156 Pearl St, Boston, Mass, earlier this month opened new and larger laboratory and manufacturing facilities at Norwood, Mass.

Sales offices also are located at the new Norwood plant, a 2-story structure that has been completely remodeled. New lighting, air conditioning and sound proofing has been added to the sales and executive offices.

Laboratory facilities are said to be available for all tests incidental to the use of dyestuffs, including light, washing, crocking, etc.

United Aniline maintains branch offices in Montreal and Charlotte.

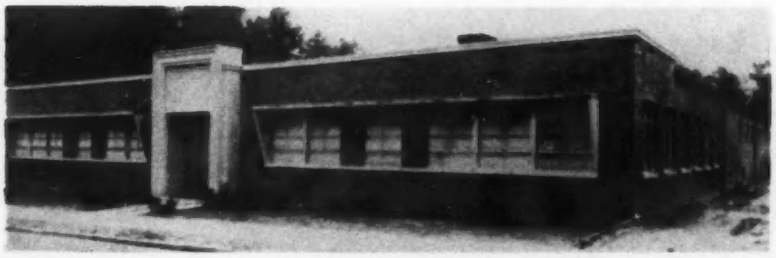
• PTI Offering 20 Regional Scholarships

The Philadelphia Textile Institute will continue its National Scholarship Program this year by making available to eligible high school students twenty full tuition Regional Scholarships valued at $1,800 each, according to an announcement by Donald B Partridge, dean of students.

Applications for these scholarships should be filed before April 15th, with Dean Partridge, c/o Philadelphia Textile Institute, School House Lane and Henry Avenue, Philadelphia 44, Pennsylvania.

Five scholarships will be awarded in each of the Middle Atlantic, New England, Mid-West and Southern areas. To be eligible students must be in the top quarter of their high school class and show evidence of need for financial aid. Final results will be determined by qualifying examinations.

The Scholarships cover the cost of tuition ($450) each year and will be awarded to candidates for Bachelor of Science degrees in Textile Engineering and Textile Chemistry and Dyeing.



Atlanta Branch Office, Dyestuff Department, Organic Chemicals Division, American Cyanamid Company

• Cyanamid Opens New Branch Sales Office

Opening of a Southeastern Dyestuff Department Sales Office of the American Cyanamid Company, Organic Chemicals Division has been announced by L C Duncan, Division manager. Offices with laboratory and warehouse facilities will be located at the American Cyanamid Building, 1370 Spring Street, NW, Atlanta 1, Georgia.

H Gillespie Smith, newly appointed Southeastern Branch sales manager, will direct the sales of dyestuffs to the states of Alabama, Arkansas, Georgia, Louisiana, Mississippi, Tennessee, and a part of South Carolina. The Cyanamid Office will be the headquarters for A C Anderson, M Louis Kirby and Jerome A Franklin, who are serving this area as Dyestuff Department sales representatives.

The laboratory will be under the supervision of S Thomas Holland.

* * * * * *

Cyanamid has named Ben Sackheim, Inc, New York, N Y, to serve the Dyestuff Department of the Organic Chemicals Division. The agency will handle all advertising of dyestuffs for the textile, plastics and soap industries, and will launch immediately a special campaign on vat dyes.

This appointment represents additional American Cyanamid business for the Sackheim agency, which was appointed last September to service the Textile Resin Department.

• Atlas Powder Office Removal

Atlas Powder Company has moved its general offices from the downtown Delaware Trust Building, where it has occupied space for 34 years, to a new building of its own on a 45-acre tract about three miles from downtown Wilmington, Del.

The new building, under construction for 14 months, is said to provide badly needed additional space as well as the most up-to-date facilities for the company's office staff.

Adjacent to the office building is a cafeteria-recreation building for employees. The grounds include a swimming pool, tennis courts and a baseball diamond for employee use.

• Howell Re-elected NAFTF President

Walter R Howell was re-elected president of the National Association of Finishers of Textile Fabrics at its 41st annual meeting held last month at the Plaza Hotel, New York, N Y. Mr Howell is executive vice president of Bradford Dyeing Association (USA), Westerly, R I.

In his annual report to the Association Mr Howell stated "the past year seems to have been satisfactory for most other lines of business, in fact, President Eisenhower, in his message to Congress, called 1954 one of our most profitable years. Nevertheless it has been a tough one for textiles in general, and as usual very tough for the textile finisher. Business started off fairly well in January and February 1954, but for the next 6 months volume was way off———and prices low———and wages high———and that combination leads only to red figures."

"Since last September this situation has steadily improved and we are all now in good shape volume-wise, but unless the low prices that were made during the bad months, when we were all trying to keep our organizations together, are withdrawn or raised, profit-wise we are not going to be much better off."

"It is particularly unfortunate for our finishing industry that we are unable to get a more steady, even flow of goods to finish. These periods of high and low receipts are bad for labor, management and customers. A finishing plant cannot drop down to say 50 or 60 percent of production and then suddenly have a spurt up to 100 percent or over and not need time for the build-up. When plants have a slack period they cannot afford to carry help and understandingly the help cannot just hang around idle until the plants get busy again. In other words if receipts and production were on a more even basis, deliveries and quality of work would be improved, making the finishing service more in line with what it should be."

"I am convinced we will continue to have good volume at least for the first six months of 1955 but of course the European or Asian situation could have some effect on this, as could further lowering of tariffs on textiles.

"To sum up I would only like to add that I have great confidence in the ability and ingenuity of the finishing industry. We are, in my humble opinion, the most important part of the entire textile set-up and we must hold our heads high and not be ashamed to ask a price that shows a profit on work well done."

Elections of officers and members of the Association's Executive Committee were held at the meeting. J Marshall Cole, Cold Spring Bleachery, Yardley, Pa and George Sinkinson, Sayles Finishing Plants, Saylesville, R I, were elected as vice-presidents.

Sydney M Cone, Jr, Cone Finishing Co, Greensboro, N C, was elected as chairman of the Executive Committee. Joseph E Hoesl was elected as treasurer.

The following members were elected to serve terms as members of the Association's Executive Committee: Robert Amory, Springs Cotton Mills, Grace Bly, Grace, S C; Robert Bendheim, Rock Hill Prtg and Finishing Co, Rock Hill, S C; E R Farrell, Mansfield Bleachery, Mansfield, Mass; James Harrell, Delta Finishing Co, Div of J P Stevens & Co, Wallace, S C; W T Kennedy, Pepperell Mfg Co; Pepperell, Ala; C Scott Lewis, Fairforest Co, Finishing Div, Spartanburg, S C; Royce N Pharr, United States Finishing Co, Norwich, Conn; William Reid, Riegel Textile Corp, Ware Shoals, S C; Chas N Robertson III, Robertson Bly & Dye Wks, New Milford, Conn; Julian Robertson, North Carolina Finishing Co, Salisbury, N C; G S Rockefeller, Cranston Print Wks, Cranston, R I; John Ward, Bellman Brook Bleachery, Fairview, N J; Richard Wood, Jr, Millville Mfg Co, Millville, N J; W R MacIntyre, Jos Bancroft & Sons Co, Wilmington, Del; Lawrence Marx, Jr, Clearwater Finishing Co, Clearwater, S C; W O Forssell, Slatersville Finishing Co, Slatersville, R I.

In addition, the following members continue to serve unexpired terms on the Executive Committee: Arthur G Poor, Standard Bly & Prtg Co, Carlton Hill, N J; C B Hayes, Pacific Mills, Lyman Div, Lyman, S C; and A L Garfinkel, Lowell Bleachery, Inc; St Louis, Mo.

• TRI Parley

The 25th Annual Meeting of Textile Research Institute, Princeton, N J, to be held March 10-11 at the Hotel Commodore, New York, N Y, will be highlighted by discussions of recent important advances in textile research and development. The meeting marks TRI's 25th anniversary.

This year's meeting will again feature an exhibit of the latest developments in process and product control instrumentation and equipment for the testing of textile materials, as well as displays by fiber manufacturers.

• Dexter Winter Sales Conference Highlights

Announcement of a new type of cotton softener, the results of two 1954 sales contests and plans for three contests this year highlighted Dexter Chemical Corp's recent two-day winter sales conference in New York.

The new product, Dexene 77, was announced by Sidney M Edelstein, president and technical director. He told the group that it was made possible through a totally new manufacturing technique developed by Dexter's laboratory. The anionic softener, he reported, produces no yellowing of the treated goods, does not affect light-fastness of dyes, facilitates high-speed sewing and cutting and produces a far superior handle on a money-value basis than any of the old-type softeners used on cotton.

Joseph B Evans, vice president in charge of sales, announced that Dexter would promote Dexene 77 throughout 1955 with advertising, direct mail and sales brochures which contain treated and untreated skeins of cotton actually showing the softening effect which Dexene 77 has on cotton.

Checks were presented to E P Henley, sales representative in Virginia and North Carolina, and to William B Griffin, who represents Dexter in Georgia, Alabama and Tennessee, as prizes for winning the two major sales contests in 1954.

Mr Evans also announced that three separate sales prizes would be awarded in 1955.

DEXTER SALES AWARD WINNERS—(L to r): Joseph B Evans, vice president in charge of sales, presents award to E P Henley, while William B Griffin is congratulated by Sidney M Edelstein, president and technical director

• Ahco Reorganizes Southern Sales Territories

Arnold Hoffman & Co, Inc, Providence, R I, has divided its southern territory with the opening of an Atlanta office and warehouse on January 1.

The new office at 3219 Cains Hill Place, N W, Atlanta, Ga, will handle all sales and warehousing for the states of Georgia, Florida, Tennessee, Alabama, Louisiana, Mississippi, Oklahoma, Arkansas and Texas. This office is under the managership of Dwight L Turner.

The other office and warehouse in Charlotte, N C, which formerly handled all southern states, will cover the states of Virginia, North Carolina and South Carolina. C Jordan Dulin will manage this office.

Turner

Dulin

• Canadian Textile Exhibition Set for April

Canadian textiles and knitted goods, from raw materials to finished products, will be paraded in Montreal for public approval in a mammoth display in April.

Beginning April 20, the Canadian textile industry and its suppliers will stage a four-day exhibit at the Sheraton-Mount Royal Hotel. The show is being organized by the Quebec Section of the Canadian Association of Textile Colourists and Chemists, in association with the Primary Textiles Institute, L'Association des Couturiers Canadiens Inc, the Federal Department of Trade and Commerce, and with textile machinery, dyestuffs and chemical suppliers co-operating.

A special feature of the exhibition will be a unique fashion show featuring gowns made from seven fibers—cotton, wool, nylon, Terylene, Arnel, acetate and viscose—in seven different and distinctive fashion shades. Garments made from the seven fibers are being designed by members of L'Association des Couturiers Canadiens and immediately after the Montreal show some of the garments will be flown direct to Belgium to be exhibited at the Brussels International Trade Fair.

The week in which the panorama of Canadian fashion and fabric is to be held will be proclaimed "Canadian Fabric and Fashion Week" and there are expected to be appropriate proclamations by mayors and other civic officials in the hundreds of towns across Canada where a textile industry is an important part of the economy.

The display of machinery, fabrics and gowns has been timed to coincide with the annual meeting of the CATCC, Quebec Section, and the sponsoring organization will hold its usual annual meeting on Friday, April 22. E F King, vice-president—sales, Dominion Textile Co, Ltd, will speak on textile merchandising in Canada. On Saturday evening, the Association's annual banquet and entertainment will be held.

Leon E Moody, first vice-president of the CATCC, Quebec Section, will serve as chairman of the exhibition committee. Other officers of the Quebec Section who are actively participating in arrangements include: L J Sheps, president; C E Coke, vice-president; A Greyborn, treasurer, and James H Lowe, secretary.

Other officials include: F D Wallace, chairman of display arrangements; Lissa Taylor and G G Racine, fashion show; John M Merriman and S G Cornthwaite, publicity; F J Knight, reception; C D Howe, Canadian minister of trade and commerce; W F Bull, deputy minister; J P C Gauthier and Fergus Grant, Department of Trade and Commerce, Ottawa; and Raoul-Jean Foure, president, Association des Couturiers Canadiens.

Group chairmen, display arrangements are as follows: George Wilkie, dyestuffs and chemical suppliers' exhibits; C E Coke, fiber exhibit; Francois E Cleyn, wool and knit goods exhibits; R J Bruck, synthetics exhibit; J H Howell, cotton exhibit; and J Soroka, textile schools' exhibits.

ADR NOW AVAILABLE ON MICROFILM

Arrangements are being continued with University Microfilms, 313 North First Street, Ann Arbor, Michigan, for supplying subscribers of the Reporter with a microfilm edition. This arrangement was effective with the 1952 volume. The film copy will be delivered at the end of the volume year for those who subscribe to the service and it will include all issues published during that period. It is estimated that the film edition requires only 5% of the space required for the paper edition, which is bound. Complete information is available from University Microfilms.

AIR VIEW of world's largest bleachery shows 16-acre expanse of insulated roof. Springs Cotton Mills recently completed new addition (upper right) to add to their bleachery facilities at Grace, South Carolina. In order to eliminate condensation and conserve heat in the winter, the entire roof area is insulated with Foamglas cellular glass insulation, a product of the Pittsburgh Corning Corporation.

• Four Technical Sessions Highlight ASQC Textile Conference

The Fifth Annual Conference of the Textile Division, American Society for Quality Control, held last month at Clemson House, Clemson, S C, attracted a large representative audience with a program which included four technical sessions, tours of nearby mills, educational sessions, meetings of task groups, and the annual banquet.

Under the sponsorship of the School of Textiles, Clemson College, the three-day conference covered the following: "Quality Control and the Human Factor;" "Quality Control and Industrial Engineering;" "Quality Control in Testing and Research;" and "Quality Control in Processing."

R G Carson, Jr served as general conference chairman.

• Amerotron Reports 'Significant Benefits'

Significant benefits in the research, manufacturing and marketing fields have already been attained by the pooling of talent and facilities of the American Woolen Company, Textron and Robbins Mills through the Amerotron Corporation, according to Robert L Huffines, Jr, president.

Amerotron is the selling, administrative and management organization formed by the three companies in October, 1954.

Mr Huffines spoke at a press preview of Amerotron's two-day "Fabric Tableau for 1955," the firm's first presentation of the full line of diversified fabrics produced by the three companies' 29 mills, as well as the end uses of many of these fabrics. The trade show was held last month at the Terrace Room of the Plaza Hotel, New York, N Y.

On display were hundreds of materials in the fields of men's wear, women's wear, children's wear, uniforms, industrial, automotive and government uses. Made of man-made fibers, wool and cotton, and of blends of all of these, many of the fabrics were fall, 1955 lines shown for the first time. Solid and decorated charcoal tones were the featured colors.

GENERAL CALENDAR OF COMING EVENTS

AMERICAN SOCIETY FOR TESTING MATERIALS
1955 Annual Meeting—June 26-July 1, Chalfonte-Haddon Hall, Atlantic City, N J.

CANADIAN ASSOCIATION OF TEXTILE COLOURISTS & CHEMISTS (Quebec Section)
Symposia: Mar 18, Apr 15 (Ciba Company's Conference Room, Montreal, Que).
Regular Meeting: Mar 19 (McGill University, Montreal, Que).
Other events: (all at the Sheraton-Mount Royal Hotel, Montreal): Apr 21-23 (Textile Exhibition); Apr 22 (19th Annual Meeting); Apr 23 (19th Annual Dinner); June 18 (Annual Golf Tournament).

DELTA KAPPA PHI FRATERNITY
1955 Annual Convention—April 29-30, Lowell, Mass.

DEUTSCHE GESELLSCHAFT FUR CHEMISCHES APPARATEWESEN
Achema XI—May 14-22, Frankfurt am Main, Germany.

DRYSALTERS CLUB OF NEW ENGLAND
Apr 29 (Hotel Vendome, Boston, Mass); June 24 (Outing—Wachusett Country Club, W Boylston, Mass).

THE FIBER SOCIETY
Spring Meeting—May 4-5, 1955, Alabama Polytechnic Institute, Auburn, Alabama.
Fall Meeting—Sept 8-9, 1955, Massachusetts Institute of Technology, Cambridge, Mass.

INSTITUTE OF POLYMER RESEARCH
Symposium: Mar 5, Apr 2 (Polytechnic Institute of Brooklyn, Brooklyn, N Y).

INTERNATIONAL TEXTILE EXHIBITION
2nd Exhibition—June 25-July 10, 1955, Brussels, Belgium.

INTERNATIONAL WOOL TEXTILE RESEARCH CONFERENCE
September, 1955—Sydney, Melbourne, and Geelong, Australia.

INTER-SOCIETY COLOR COUNCIL
24th Annual Meeting—April 6, Skytop, Hotel Statler, New York, N Y.

NATIONAL ASSOCIATION OF HOSIERY MANUFACTURERS, KNITTED OUTERWEAR ASSOCIATION, THE UNDERWEAR INSTITUTE
42nd Knitting Arts Exhibition—April 25-29, Convention Hall, Atlantic City, N J.

NATIONAL COTTON COUNCIL OF AMERICA
1955 Chemical Finishing Conference—Sept 20-21, Chalfonte-Haddon Hall, Atlantic City, N J.

PHI PSI FRATERNITY
Annual Meeting—April 14-16, Beaconsfield Hotel, Brookline, Mass.

SOUTHERN MUNICIPAL AND INDUSTRIAL WASTE CONFERENCE
4th Annual Conference—Mar 31-Apr 1, College of Engineering, Duke University, Durham, N C.

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION
Mar 9, Apr 13, May 11, Sept 14, Oct 11, Nov 9 (Hotel Commodore, New York, N Y); June 9-11 (Outing———The Greenbrier, White Sulfur Springs, W Va).

TAPPI (Metropolitan District)
Mar 8, Apr 12, May 10 (Fraunces Tavern, New York).

TEXTILE RESEARCH INSTITUTE
25th Annual Meeting—March 10-11, Hotel Commodore, New York, N. Y.

NAMES IN THE NEWS

Hilldring

Colman

Walsh

Lang

Goldman

Warshaw

JACK FRYE, president of General Aniline & Film Corp, informed the Board of Directors at its January meeting that he wishes to resign from the presidency and as a director, effective April 1st, to devote attention to a new aviation development along with other interests.

The Board agreed to the selection of JOHN H HILLDRING, executive vice president, to succeed Mr Frye as president. Mr Hilldring was also elected to the Board.

Key organizational changes in GAF's Dyestuff and Chemical Division have been announced as the Company prepares for an expanded sales program coincident with the expected completion this year of two new manufacturing plants, the $6 million acetylene products plant being erected at Calvert City, Ky, and the $5 million chlorine-caustic plant under construction at Linden, N J.

S STEPHEN COLMAN has been named general purchasing agent, from which position he will direct all purchasing activities for the Division's manufacturing plants, and for General Dyestuff Co and Antara Chemicals, GAF sales divisions.

WILLIAM L WALSH, plant manager at Linden, has been appointed manager of manufacturing in charge of all production operations at all the Company's dyestuff and chemical plants.

JOSEPH W LANG, director of research at the Company's Easton, Pa, laboratory, has been named divisional director of research with responsibility for all research and development.

A O ZOSS, technical manager at Linden, succeeds Dr Walsh as plant manager there.

In line with these appointments, other staff changes include:

F WUERTH has been appointed to the staff of Dr Zoss as manager of design engineering. He will continue to supervise the design work on the Calvert City plant.

M R STEVINSON and D B ANDREWS, now at Linden, have been named to Dr Lang's staff to be in charge of process development and process engineering for the division respectively.

At the same time, D I RANDALL and W W WILLIAMS, now at Easton, have been transferred to the Sales Department as technical assistants to J R BONNAR, dyestuff sales manager in New York. They will be responsible for the evaluation of dyestuff sales problems in terms of research and development possibilities, and to provide improved communication with the research and development groups under Dr Lang on those problems.

Other appointments affecting Easton personnel include: H T THOMPSON, assistant to Dr Lang; J M WILKINSON, research manager, new fields; C F JELINEK, research manager, surfactants; and L T HALLETT, research manager, analytical services.

Dr Walsh will continue to maintain his offices at Linden, and Dr Lang will also establish his principal headquarters there, although continuing his supervision over the Easton laboratory.

JULIUS GOLDMAN and STUART A WARSHAW have been elected to the offices of vice president of Berkshire Color & Chemical Corp, Springfield, Mass.

Mr Goldman has been associated with the company for the past eight years in the capacity of assistant general manager and purchasing agent. Mr Warshaw is currently representing the company as a technical salesman in the New England territory.

ROGER WILLIAMS, vice president of E I du Pont de Nemours & Co, Inc, became the 49th recipient of the Perkin Medal of the American Section, Society of Chemical Industry on January 14th at the Hotel Waldorf Astoria, New York. The award is given for outstanding achievement in American industrial chemistry.

The medal was founded in 1906 and was first awarded to Sir William Henry Perkin in commemoration of the fiftieth anniversary of his synthesis of mauve, the first synthetic dye. Subsequently it has honored outstanding American industrial chemists for achievements in the field of applied chemistry that have helped raise our standard of living.

KARL M CURRIER has been named to succeed the late EDGAR S KENNEDY as director the Textile Research Department of American Viscose Corp. GRAEME G WHYTLAW will continue as assistant director and HARRISON D HOUSE, formerly executive assistant to Mr Currier, has also been named assistant director. Mr Currier, who joined Avisco in 1931, has been a member of TRD since it was founded in 1939.

Within Avisco's sales organization, JOSEPH L HUNTER has been transferred to a rayon staple sales assignment at the Charlotte, N C, office. Previously a Filatex salesman there, Mr Hunter is assuming the duties of LEON HAM, who resigned recently. F LAWRENCE RAPP, formerly of TRD, will succeed Mr Hunter in Filatex sales.

DONALD PRICE, prominent authority on surface-active agents, detergents and cleaning materials, has entered the consulting field. Dr Price, who holds thirty-five US and foreign patents, will specialize in surface-active agents, cleaning materials, the chemistry of oils and fats and research administration.

Among the firms with which Dr Price has been associated are the National Oil Products Co (now Nopco Chemical Co), and Interchemical Corp, New York. Since 1945 he has been technical director of Oakite Products, Inc.

MAX J WEYL, Ernest L Frankl Associates, has returned from a 6-week trip to Europe, where he studied the STF Pad-Roll Dyeing Machine in mill operation. Ernest L Frankl Associates, New York, is the sole agent in the U S and Canada for the machine, which is manufactured by AB Svenska Textilmaskin fabriken, Goteberg, Sweden.

JULIAN T CHASE, resident manager for National Aniline Division, Allied Chemical & Dye Corporation at Charlotte, N C, since 1934, has retired after fifty years of continuous service in the dyestuff industry. He is succeeded by JOHN K BOYKIN, resident manager at Atlanta, Ga, since Sept, 1953. Mr Boykin in turn is succeeded at Atlanta by T M FERGUSON, who has been in charge of National's technical service laboratory there.

Mr Chase was honored recently at a testimonial dinner given by his associates at the Hotel Warringer and was presented with a silver tea service as a memento of his long tenure. In tendering this token from his fellow workers at National Aniline, H J DAIGNEAULT, vice president of sales, noted that Mr Chase had entered the dyestuffs industry at Atlanta in 1905 as a technician for the Cassella Color Company (a predecessor of National Aniline) and had since been continuously engaged in dyestuffs sales and technical service. He will reside near Charlotte and will be available to National Aniline Division for consultation.

JOHN E ANDRE, executive vice president, American Alcolac Corp, has returned to the United States after a two month tour of France, England, and Germany. During his trip he met with leaders of the European chemical industries to discuss inter-industry problems and new methods.

Mr Andre, former director of sales for Sinnova of France, also visited the Sinnova plants in Europe.

MORRIS J WARREN, who recently joined American Alcolac Corp, has been named salesman for the Pennsylvania area.

Mr Warren, who will handle the firm's full line of synthetic detergents, has spent the last several months in Alcolac's Baltimore laboratories.

American Cyanamid Co has announced the appointment of ERNEST K HUNT as public relations manager, and H GILLESPIE SMITH as branch manager of the new Atlanta sales office, Dyestuff Department, Organic Chemicals Division.

Mr Hunt, former advertising manager of both the Organic Chemicals Div and the Pigments Div, has been with Cyanamid for eleven years.

Mr Smith, who has served the Southeastern Section, AATCC, as chairman and councilor, joined Cyanamid in 1933 as a Dyestuff Department sales representative with headquarters in Chattanooga, Tenn. In 1938 he was made the Atlanta area representative, a position he held until his present appointment.

JACK E McLAUGHLIN has been appointed assistant manager of the Textile Sales Development Dept of E F Houghton & Co, Philadelphia. He has been with Houghton since 1951 as a member of the technical staff, specializing in textile applications.

R W HOOKER, vice president of Hooker Electrochemical Co, Niagara Falls, N Y, was reelected to his seventh consecutive term as president of The Chlorine Institute Inc at its annual meeting in New York last month. BERT CREMERS, vice president, Michigan Alkali Division, Wyandotte Chemicals Corp, was elected vice president. ROBERT T BALDWIN was reelected secretary-treasurer.

The Chlorine Institute has promoted safety in the packaging, transportation and use of chloride since 1924. Its 24 members include all the major chlorine producers in the United States and Canada.

WALTER M GREER has joined Texize Chemicals, Inc, Greenville, S C, as a textile sizing sales representative in the company's Industrial Division.

Mr Greer has been associated for the past three years with the Victor Monaghan Division of J P Stevens in the Victor and Duncan Mills. Prior to his association with the Stevens chain, Mr Greer was with the Industrial Division of Texize for four years.

With Texize, Mr Greer will contact textile mills in Alabama, South Carolina and Georgia from headquarters in Greenville, S C.

Appointment of STANLEY KORDZINSKI as chief chemist of the Catalin Corporation of America was announced last month. CCA, with office in New York, maintains plants in Fords, N J, Calumet City, Ill, and Thomasville, N C.

WILLIAM J HOUSTON has been appointed general sales manager of Nuodex Products Company, a subsidiary of Heyden Chemical Corporation.

Mr Houston, who joined Nuodex in 1946, has been manager of the paint and varnish division since 1953.

The Cravenette Co, USA, Hoboken, N J, announces that ERNEST H BENZING has joined the company's Chemical Division sales force.

Mr Benzing, who conducted a consulting service following a 22-year association with American Bemberg Corp, will call on manufacturers and converters, dyers and finishers in the New York City and northern New Jersey area.

JOHN B DICKSON, formerly technical analyst with the Textile Division, U S Rubber Co, recently joined the staff of the Southern Regional Research Laboratory at New Orleans, La, as a part-time consultant in the Laboratory's cotton research program.

Dr Dickson will participate in the Laboratory's broad program to develop new principles in this field. He will work under the direction of R J CHEATHAM, head of the Cotton Mechanical Processing Section of the Southern Laboratory, a unit of the USDA Southern Utilization Research Branch.

Hunt

Smith

McLaughlin

Houston

Benzing

Dickson

Gellene

Valter

Hurd

Refined Products Corp, Lyndhurst, N J, has announced the appointment of JOHN G GELLENE to a position in the Sales and Technical Service Department.

JOHN J VALTER has been named technical sales representative for Crown Chemical Corporation, Providence, R I. Mr Valter will cover South Carolina and portions of North Carolina, Georgia, Alabama and Tennessee for Crown and will make his headquarters in Greenville, S C.

Most recently Mr Valter has served as technical sales representative for Metro-Atlantic, Inc, with headquarters in Greenville.

IRA S HURD has resigned as textile chemical sales Manager of E F Drew & Co, effective March 1st. Mr Hurd, who previously was with Warwick Chemical Co, Rohm & Haas Co and Dan River Mills, has not announced his future plans. His successor at E F Drew has not yet been named.

GEORGE F LANGHIRT, formerly of S Blickman, Inc, Weehawken, N J, has joined the sales organization of Glasco Equipment Corp, 2 Wait St, Paterson 4, N J.

The appointment of EDWARD H GROSSE as research group leader of the textile section of its technical service department has been announced by the A E Staley Manufacturing Co, Decatur, Ill.

Mr Grosse was formerly employed by Dan River Mills at Danville, Va.

ROBERT L AMSLER has been appointed to the Product Development Group of The Chemstrand, Decatur, Ala.

Prior to joining Chemstrand, Mr Amsler was associated with E I du Pont de Nemours & Company, Inc, Wilmington, Del, and James Lees & Sons Company, Glasgow, Va.

PAUL S HESS has been appointed technical director of General Plastics Corp, Paterson, N J. In his new post, he will head GPC's research division as well as the customer service department.

Mr Hess has been working in the field of resins and plastics since 1939. His former associations were with the National Lead Research Laboratories and Congoleum-Nairn.

In connection with the Centennial Celebration of the College of Engineering of New York University citations were conferred, on January 29th, upon a number of alumni whose significant achievements have brought distinction to their Alma Mater and themselves.

Among those selected for this honor were H BENNETT, president of the Glyco Products Co, Inc, of Brooklyn, N Y and Williamsport, Pa.

ALVAH H TENNEY has been appointed manager of market research, Carbide and Carbon Chemicals Co, a Division of Union Carbide and Carbon Corp. In his newly created position, Dr Tenney, formerly product manager in the Fine Chemicals Division, will be responsible for the surveys of future markets for established chemicals as well as new chemicals emerging from the laboratories. He will assist R L BATEMAN, who was recently appointed director of product development.

In Carbide's Chemicals Division, De FRANCE CLARKE, JR has been appointed assistant manager, and DAVID S ALCORN, product manager. Mr Clarke has served as a product manager in the Division since 1953. Mr Alcorn will continue his work on the market development of aryl chemicals.

A B STEELE has been appointed manager and C P McCLELLAND, assistant manager, of the newly created Technical Service group. Dr Steele, who was appointed senior fellow at Mellon Institute in 1950, will be in the New York offices of the Company. Mr McClelland is a former product manager in the Fine Chemicals Division.

ROBERT H KAMPSCHULTE has been named general sales manager, Chemical Division, Celanese Corporation of America. Mr Kampschulte, who joined the Company in 1947 and has been assistant general manager since 1952, succeeds JOHN W STEVENS, resigned.

Continued growth of the Chemical Division and plans for future expansion have necessitated a reorganization of the Product Development Department. As a consequence, three operating groups———sales development, new chemical development, and market research———have been established within the department.

ROBERT J DAVIS has been named supervisor of the sales development group; HOWARD L PILAT, supervisor of the new chemical development group, and WINTHROP M BARNES, supervisor of market research.

In addition special projects of the Department will be established as the need develops. The first of these to be launched is in functional fluids, for which HOWARD G ZBORNIK is project leader.

GEORGE W EWALD and DAVID L FOX have joined Celanese's Development Department to assist the Company's long-range-planning activities. Mr Ewald, formerly associated with Martin Fabrics Corp and Concordia Gallia Corp, will operate in the field of new textile products and markets. Mr Fox, previously with McKinsey & Company, will be responsible for appraising opportunities for diversification.

RALPH E HOWELL, manager of the Norcross Corporation for the past 6½ years, is now associated with the Charlotte Chemical Laboratories, Inc, Charlotte, N C, as chief chemist and plant manager.

J P SISLEY, general manager, Institute de Corps Gras (France), has been awarded the grade of Chevalier of the Legion of Honor, which was conferred on him by the Minister of Industry and Commerce for services rendered to the chemical industry during 30 years of professional practice and military service.

Two new scholarships have been given to Lowell Technological Institute students majoring in chemistry through the generosity of the Interchemical Corporation of Pawtucket, R I.

Recipients are MARCELLA CZEKANSKI and PHILIP S LAMPREY, who will hold the award for their junior and senior years at LTI.

Screen and Roller Printers: After long months of research Arnold, Hoffman has developed an *improved* Ahcovat Soluble Green IB Paste.

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Advertisements in this section are restricted to HELP WANTED—POSITIONS WANTED—EQUIPMENT wanted or for sale. Rates, effective February 1, 1954: One-time, $10.00 per column inch; 3 consecutive times (same copy), $9.00 per column inch; 13 or more times, $8.00 per column inch; Position Wanted, $2.00 per column inch. Figure 38 average words per column inch. Publisher reserves the right to reject or discontinue any classified advertisement. Replies should be addressed: Box Number . ., c/o American Dyestuff Reporter, 44 East 23rd Street, New York 10, N. Y.

ABSTRACTING SERVICE—Abstracting and digesting of foreign patents and periodicals. Literature review and special reports in dyestuff and cellulose chemistry. PAUL WENGRAF, 88-36 ELMHURST AVENUE, ELMHURST 73, NEW YORK.

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POSITION WANTED: L.T.I. graduate. Over 15 years' experience in dyestuff industry in sales, service and management. Desires responsible position requiring administrative and technical ability. Write Box No. 844.

POSITION WANTED: Pigment-emulsion consultant. Extensive experience in textile pigment printing. Seeks dyestuff or textile chemical manufacturer who is interested in water-phase pigment printing. Offers a complete line of colors and auxiliaries. Write Box No. 843.

POSITION WANTED: Textile Chemist and Dyer. Extensive finishing and laboratory experience. Seeks connection in process development, technical representation, or highly responsible supervisory position in dyeing and finishing plant. Write Box No. 819.

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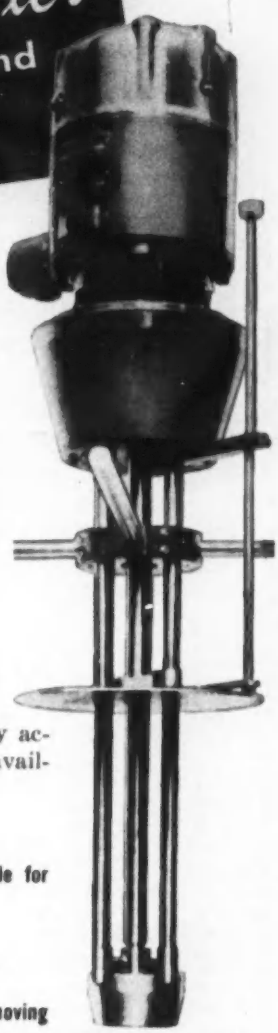

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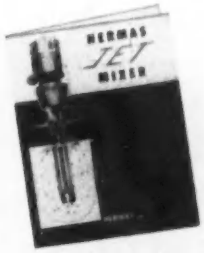

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